Southern Power & Ind y

he Industrial and Power Journal of the South an est

EPTEMBER, 1958

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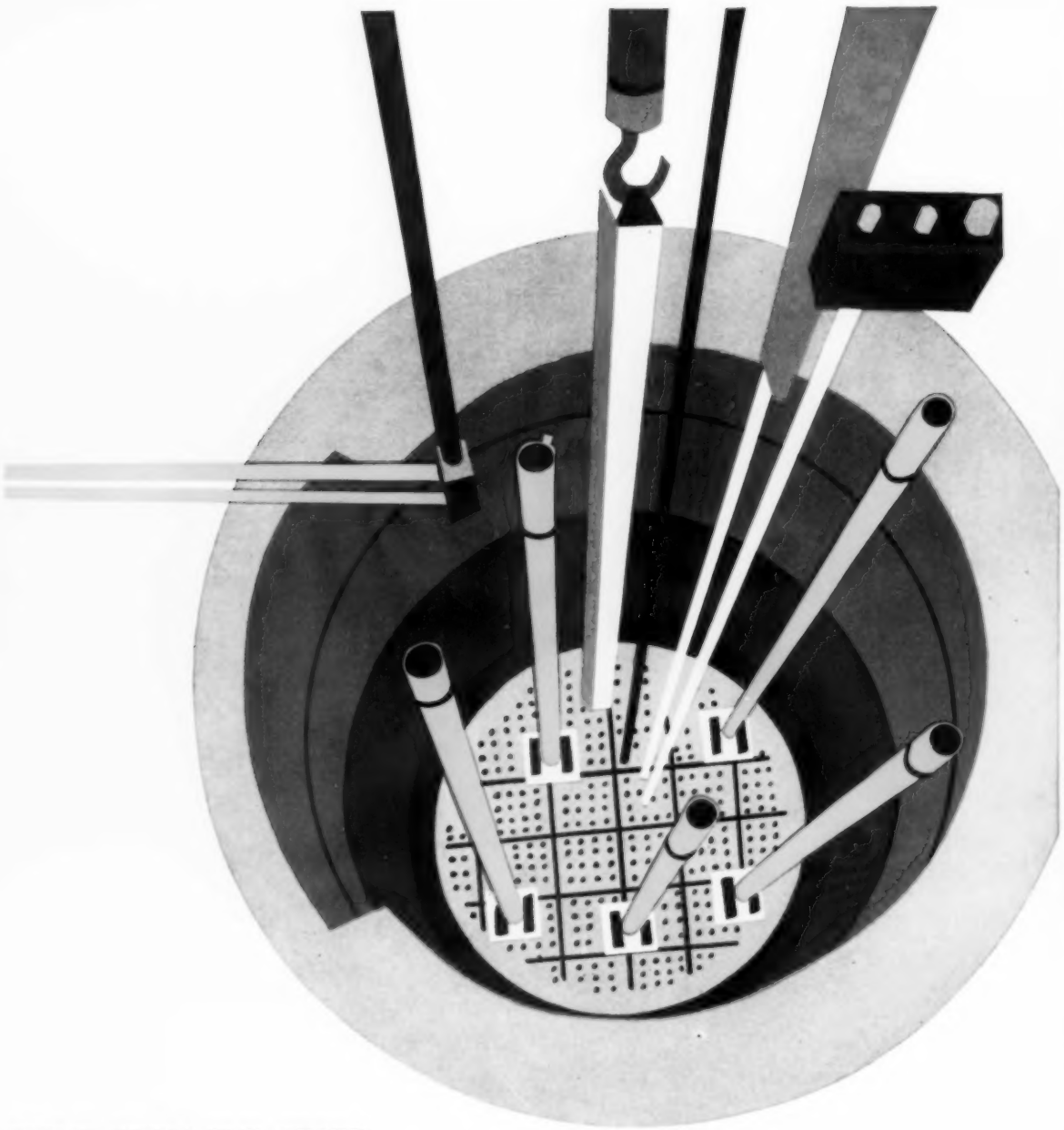
Trouble Shooting With a Camera

Ailments Diagnosed

see p 37



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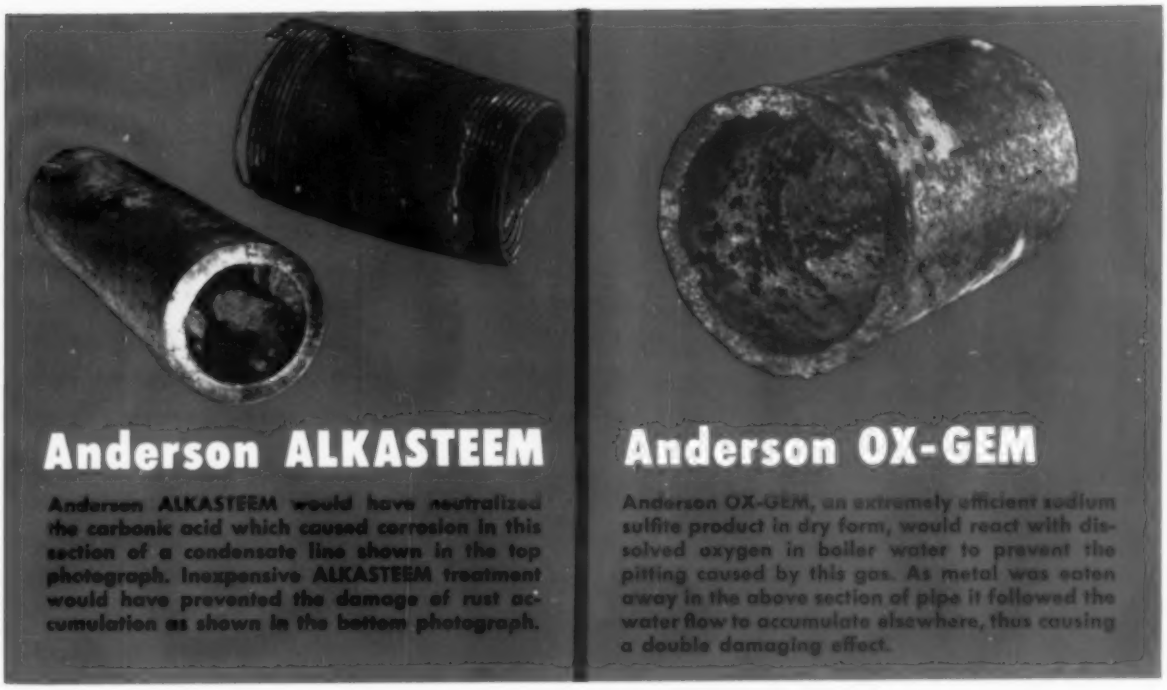
Volume 76 Number 9

YOU CAN STOP CORROSION

in your boilers, steam lines and condensate lines



Anderson ALKASTEEM

Anderson ALKASTEEM would have neutralized the carbonic acid which caused corrosion in this section of a condensate line shown in the top photograph. Inexpensive ALKASTEEM treatment would have prevented the damage of rust accumulation as shown in the bottom photograph.

Anderson OX-GEM

Anderson OX-GEM, an extremely efficient sodium sulfite product in dry form, would react with dissolved oxygen in boiler water to prevent the pitting caused by this gas. As metal was eaten away in the above section of pipe it followed the water flow to accumulate elsewhere, thus causing a double damaging effect.

You can stop the corrosion at the water line and above it in boilers, steam lines, steam traps, valves, unit heaters and return condensate lines. Corrosion is more frequently caused by dissolved gases such as carbon dioxide and oxygen. When these gases occur in combination the rate of corrosion is greatly increased. If corrosion is allowed to go unchecked the result, of course, is costly shut-downs for repairs and expensive replacements.

Throughout the South, hundreds of engineers rely on Anderson ALKASTEEM and OX-GEM and the counsel of Anderson's field service representatives to check these corrosive gases. The life of equipment is prolonged and the operating efficiency of your water system is increased. The Anderson man is a good man to know.

FREE SURVEY AND ANALYSIS SERVICE

Anderson Service Representatives will be glad to discuss your particular water problems and make recommendations based on an analysis of the makeup water. There is an Anderson representative in your area who will gladly work with you. His services cost you nothing. They can save you much.

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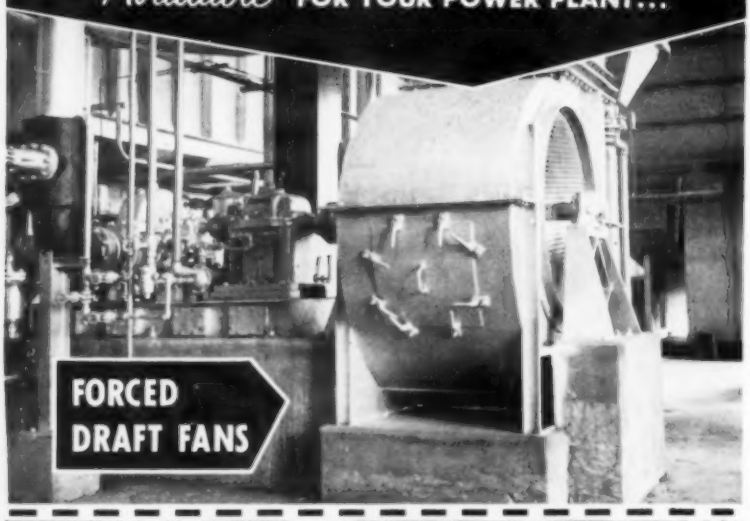

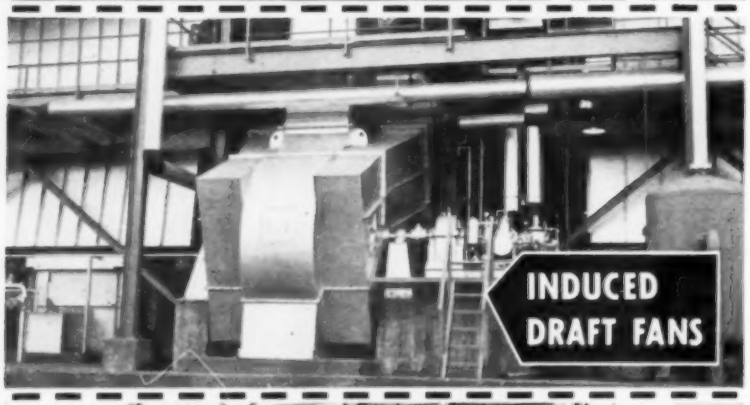

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Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

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No. 9

SEPTEMBER, 1958

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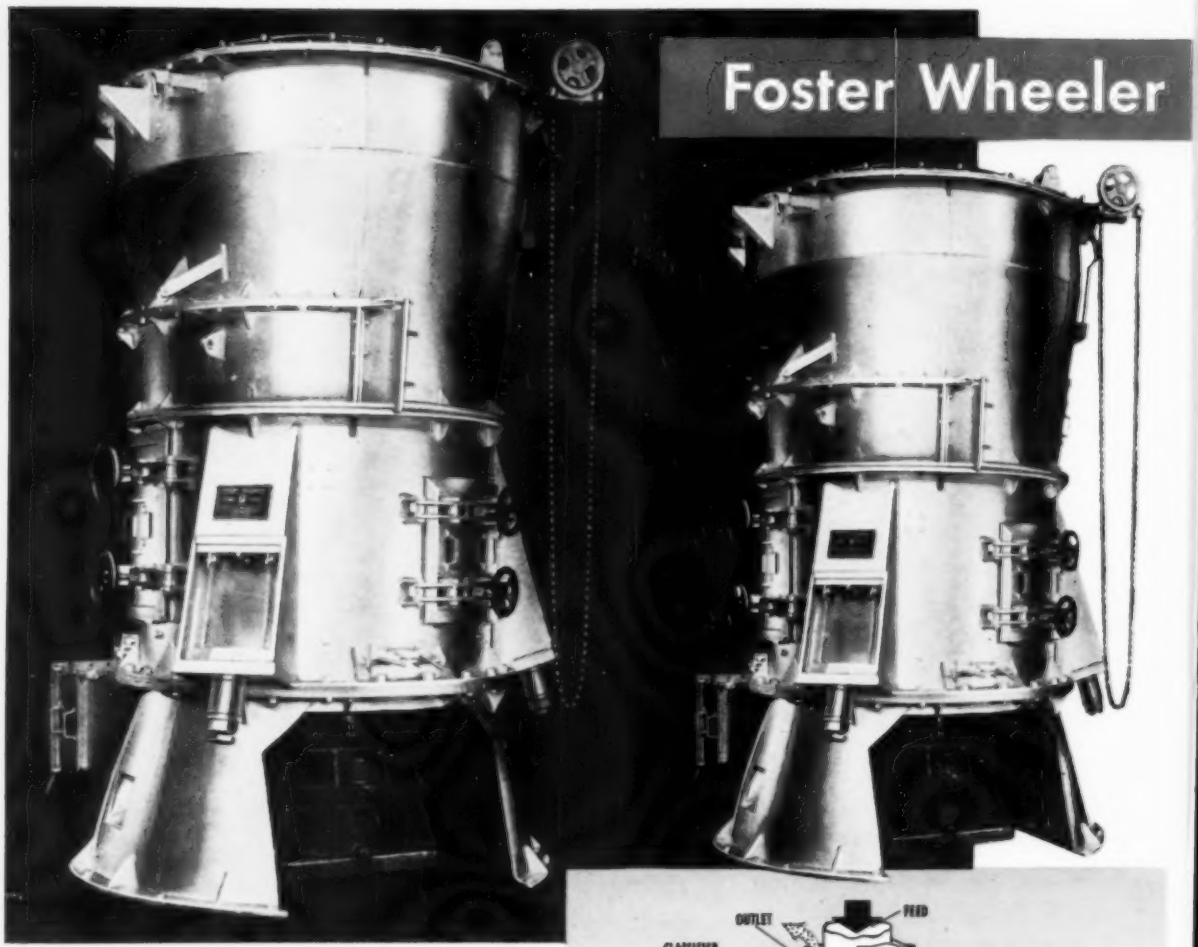
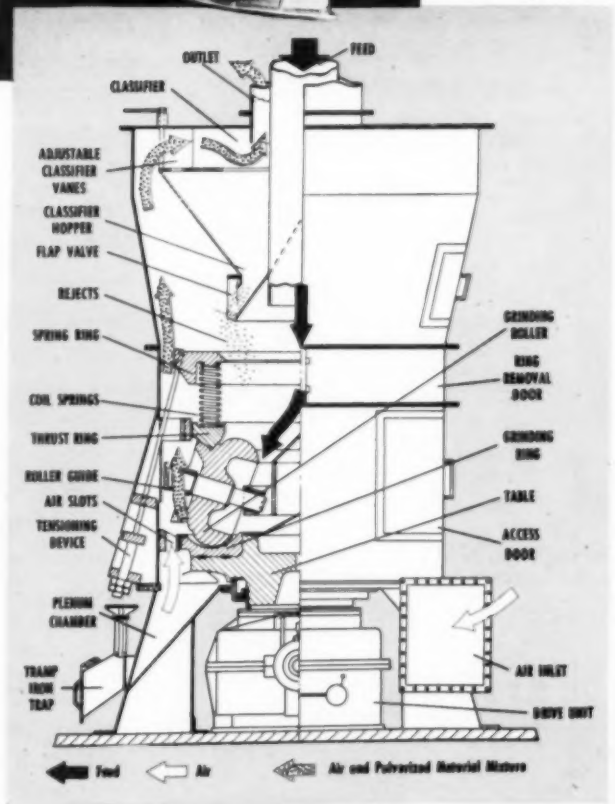


HOW THE MB PULVERIZER WORKS

In the MB Pulverizer, grinding action takes place between a slowly rotating horizontal table and three spheroidal rollers, uniformly spaced around the table and loaded by the adjustable thrust of a large number of heavy coil springs. The power driven table causes the rollers to rotate while circling planet fashion and rolling over the material on the table. The rollers move up and down independently of each other as required to compensate for foreign matter in the charge.

The charge, entering the mill, is fed directly onto the grinding table, where it is crushed between the table and the rollers. Air entering from below the pulverizer table, floats the ground particles up into the classifier, located in the top of the housing. Particles too coarse to be carried to the classifier fall back onto the table for further pulverization. The classified pulverized fuel is discharged through the outlet at the top of the casing.



"MB" PULVERIZERS

offer proved advantages of

LOW POWER CONSUMPTION and LESS MAINTENANCE

Planetary Roll and Table Design, with 9 years of successful operating experience in Europe, now available in capacities up to 60 tons per hour

THE FOSTER WHEELER Type MB Pulverizer is a simple, compact, planetary roll and table mill for pulverizing solid fuels to commercial fineness with exceptionally low power consumption, low maintenance cost and high availability.

Introduced in Europe in 1949, this type of mill has now had nine years of service experience, with excellent performance records and outstanding economy of operation. Its proved advantages, summarized below, can contribute materially to important savings in the cost of pulverized fuel for large or small steam generators.

Low Power Consumption. Efficient grinding action results in unusually low power requirements per ton of capacity, assuring lower operating costs, year after year.

Low Maintenance. Extremely rugged construction and easy accessibility of all wearing parts reduce down-time for servicing. There are no bearings or lubricated parts subject to dust and heavy pressure. Grinding ring and rollers wear *slowly* and *uniformly* and can be easily replaced when required.

Uniform Product Fineness. Throughout the life of the grinding elements, uniform product fineness is readily maintained without loss of capacity.

Pressurized or Suction Operation. With all moving parts enclosed in a stationary, air-tight casing, the MB Pulverizer can be used for either pressurized or suction operation, providing complete flexibility for various types of firing service.

High Availability. All necessary adjustments for grinding pressure and particle size can be made externally while the mill is in operation, avoiding shutdowns except for periodic inspection or overhaul.

The type MB Pulverizer, with Foster Wheeler feeders, distributors, burners and fans or exhausters, provides a highly efficient and economical pulverized fuel system, supplementing the FW line of heavy-duty Ball Mill systems. For complete information, send for Bulletin MB-58-1. *Foster Wheeler Corporation, 666 Fifth Ave., New York 19, New York.*

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For more information, use Reply Card—Page 85

Facts and Trends

September 2, 1958

- TALK THEIR LANGUAGE—Remember that a profit-making company is concerned with profits and not thermodynamics. When you are trying to get that '59 plant budget approved, present your case to top management in ESTIMATED DOLLARS SAVED. Typical plant problem and constructive suggestions by SPI's Management Clinic is outlined on page 34.

- PLANT SERVICES for Martin-Orlando's $18 million missile plant in Florida are featured on pages 42-46. Mr. A. R. Bergstrom, Director of Plant Facilities highlights power distribution, lighting, air conditioning, water supply and waste treatment. Economical construction, low maintenance costs and a complete facility in less than a year were design criteria.

- THERE IS ALWAYS A BETTER WAY—Although the Rome, Georgia transformer manufacturing plant of General Electric has been in operation less than 5 years, over 1,000 employees have shared more than $12,000 in SUGGESTION AWARDS. Pages 48-52 summarize how the Georgia plant suggestion plan puts ideas to work in a hurry, to the benefit of both company and employees.

- MOTOR INSULATION—Recent insulation strides have advanced open-type motor applications. One factor is an all-silicone-rubber insulating system for stator coils and another is epoxy-encapsulated coil structures for field windings. Properties and various industry applications are discussed on page 54.

- GOOD LIGHTING for your office is just as much a tool for production as lighting in the work areas of the plant. Fixture designs and proper selection factors are featured on page 60.

- PRODUCT TRENDS—DUSTLESS UTILITY DRILL by Thor (p 77) sucks in drilling dust through hollow drilling steel with the dust moving out ports in the back head of the tool and into special dust-extracting tanks . . . 99% fused silica INSULATING MATERIAL by Pittsburgh Corning (p 78) offers continuous insulating protection from -450 F to 2200 F . . . flexible ALL-STEEL SANDPAPER by Red Devil Tools outcuts conventional sandpaper by at least five to one and outlasts it more than ten to one without clogging.

- LEAKING TUBES in old divided water box condensers at Vepco's Portsmouth, Virginia station are being located with Saran Wrap transparent plastic sheets. Section of condenser that is leaking is located by recording conductivity of the condensate. Load is reduced and this half of condenser is removed from service.

  Inlet and outlet water boxes are drained and the entire tube sheet at both ends is covered with Saran plastic. Vacuum pulls the plastic sheet into the leaking tube and although the degree of indentation may be slight, it can be readily detected.

- NEXT MONTH don't miss BETTER PRODUCTION—58 where Southern & Southwestern design, operating and maintenance personnel will tell how they overcame plant difficulties and improved service. Over 80 from-the-plant case studies will report improvements in electrical systems and controls, lubrication, maintenance, water systems, power and steam generation, etc.

POWELL

world's largest family of valves

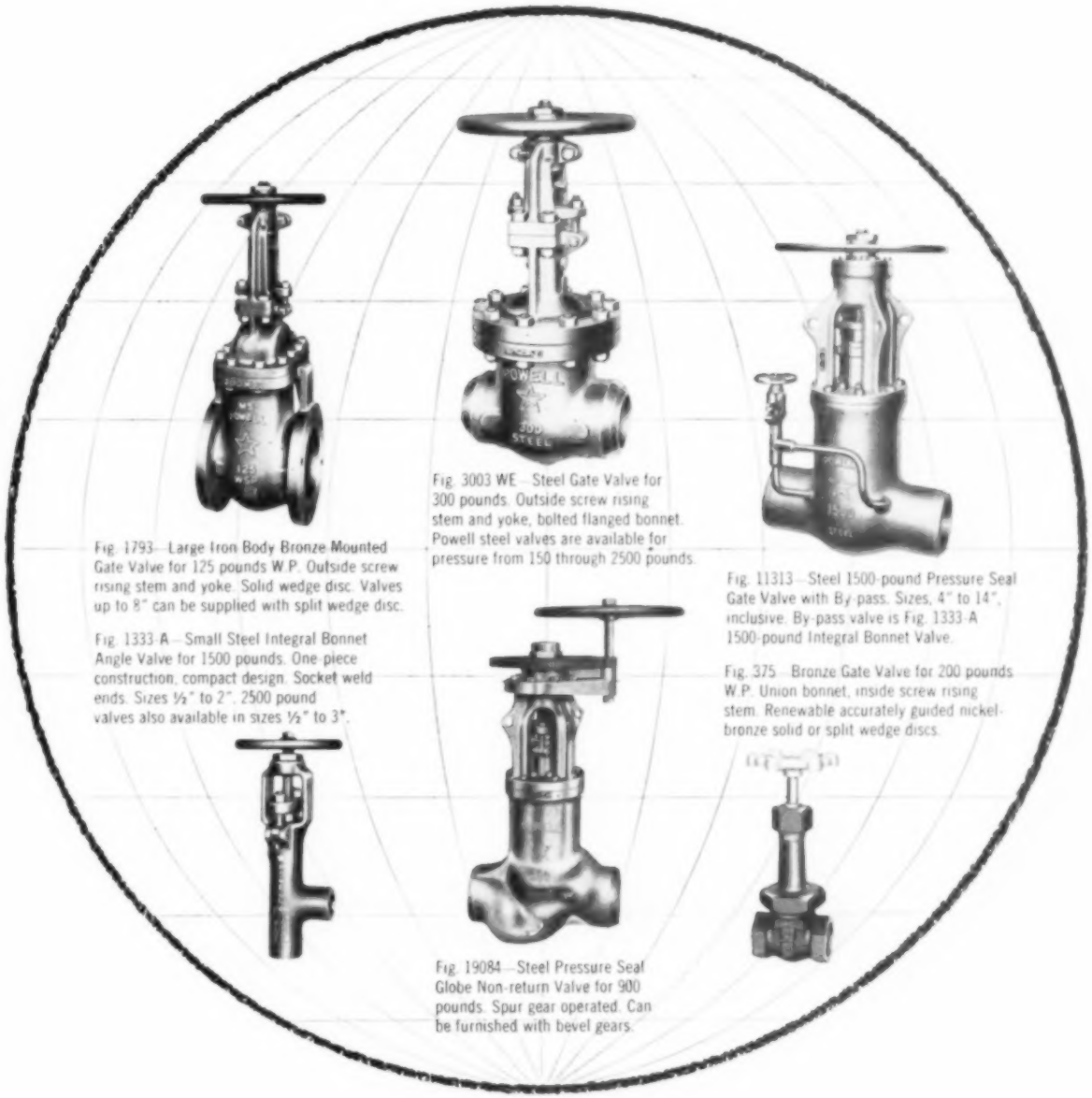

Fig. 1793—Large Iron Body Bronze Mounted Gate Valve for 125 pounds W.P. Outside screw rising stem and yoke. Solid wedge disc. Valves up to 8" can be supplied with split wedge disc.

Fig. 1333-A—Small Steel Integral Bonnet Angle Valve for 1500 pounds. One-piece construction, compact design. Socket weld ends. Sizes ½" to 2". 2500 pound valves also available in sizes ½" to 3".

Fig. 3003 WE—Steel Gate Valve for 300 pounds. Outside screw rising stem and yoke, bolted flanged bonnet. Powell steel valves are available for pressure from 150 through 2500 pounds.

Fig. 19084—Steel Pressure Seal Globe Non-return Valve for 900 pounds. Spur gear operated. Can be furnished with bevel gears.

Fig. 11313—Steel 1500-pound Pressure Seal Gate Valve with By-pass. Sizes, 4" to 14", inclusive. By-pass valve is Fig. 1333-A 1500-pound Integral Bonnet Valve.

Fig. 375—Bronze Gate Valve for 200 pounds W.P. Union bonnet, inside screw rising stem. Renewable accurately guided nickel-bronze solid or split wedge discs.

A solution for every kind of flow control problem is as near as your local Powell distributor. Powell valves are designed and engineered in the largest variety of metals and alloys, to handle any medium, every flow control requirement. There are Powell distributors in all principal cities. Or, if yours is a special engineering problem, write to:

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

NEWS for the South & Southwest

$2,500,000 CONTAINER CORP. MFG. PLANT FOR DALLAS–FT. WORTH AREA

Great Southwest Corporation is constructing a $2,500,000, 195,000 sq ft manufacturing plant for the **Container Corporation of America** in the Dallas-Fort Worth Industrial District. Installation will house the folding carton operation carried on by the Company in Fort Worth for the past 18 years. The corrugated container unit will continue to function at the present Fort Worth site.

From an industrial standpoint and as a market, Container Corporation regards Dallas and Fort Worth as a single economic entity and considers the Great Southwest Corporation's 5,000 acre industrial district midway between the two cities as an ideal location. New plant will produce a general line of folding cartons for the highly diversified Dallas-Fort Worth market and other packaging users in the Southwest. Architects are **Hedrick and Stanley** of Fort Worth in association with **Beran and Shelmire** of Dallas.

$1 Million Expansion for Hooker Chemical in Mississippi

Hooker Chemical Corporation is planning another million dollar expansion of Oldbury brand sodium chlorate production at the **Columbus, Miss.** plant. To be completed by April 1959, this will bring Hooker's total investment at Columbus to approximately $7,000,000. Three major increments will have then been added, more than doubling the original capacity of 12,000 tons per year at this plant which began production in late 1954. Another million dollar expansion has recently been completed. Contractor for both expansion projects is D. S. McClanahan and Son of Columbus.

Harry R. Oswald is works manager of the plant which employs about 75 people and is located on the Tombigbee River six miles south of Columbus. Eleven acres of the 465-acre site are currently being used. Phosphorus pentasulfide is the other product produced, used in volume in lubricant additives as well as in phosphorus-containing insecticides and ore flotation agents.

T.C.I. Expanding Fairfield Tin Mill

United States Steel's **Tennessee Coal & Iron Division** in Fairfield, Alabama will install a new continuous annealing line in its strip steel processing equipment. Engineering for the 457 ft installation is in progress and complete installation will require about two years.

In the annealing process, steel strip is heated up to temperatures as high as 1350 F to soften the steel following the cold reduction operation. New installation will replace obsolete annealing equipment, in which coils of steel strip are placed in box-like furnaces. The new line will move continuously without a halt in the process.

McMeekin Station of SCEGCO Is on Line

While official dedication ceremonies are scheduled for the future, **South Carolina Electric & Gas Company's** huge McMeekin Station at Saluda Dam has begun operation as a commercial unit. Adding 137,500 kw of power, the first unit boosts the Company's generating capability to 752,500 kw. Second unit is scheduled for completion this fall.

$1 Million Reichhold Terminal for Mobile

A one million dollar deep water terminal on the ship channel at Mobile, Ala., is under construction by **Reichhold Chemicals, Inc.**

Plans for the new terminal were made by a team of RCI's engineers and chemists headed by P. J. Ryan, vice president in charge of the Southern Division, whose responsibilities will include its overall operation. The terminal will have a capacity of several million gallons of liquids as well as being capable of extensive bulk handling of dry chemicals.

The terminal will include extensive space for drumming and storage of finished products. In addition to all forms of water transportation, shipments can be made from the terminal by railroad or truck.

(Continued on Page 12)

KELLOGG'S FABRICATING TECHNIQUES KEEP PACE

Fabrication of the Type 316 Stainless main steam piping for Philadelphia Electric Company's new Eddystone Station, Unit No. 1, comes nearer to completion—in The M. W. Kellogg Company's Jersey City shops.

Designed for use at a record 5,000 psi-1200 F., these steam lines required the heaviest wall thicknesses ever used in Type 316 steam-electric plant piping.

To fabricate 2,400 ft. of such heavy-walled stainless piping to exacting specifications is, in itself, a task that few fabricators could be entrusted to undertake. For many years M. W. Kellogg has been testing and evaluating materials, and perfecting fabricating techniques, in conjunction with the foremost power companies and major equipment suppliers. This experience assures today's ultimate in operating efficiency.

Kellogg welcomes the opportunity to discuss its complete power piping design, fabrication, and erection facilities with consulting engineers, engineers of power generating companies, and manufacturers of boilers, turbines, and allied equipment.

Photo above, of section of Type 316 piping being welded, dramatically shows ratio of wall thickness to inside diameter. This section has already been bent, in rear, to a 90° angle. Below, welded joints of smaller section of Type 316 being ground to dimensions. The bend on this section is visible at left.

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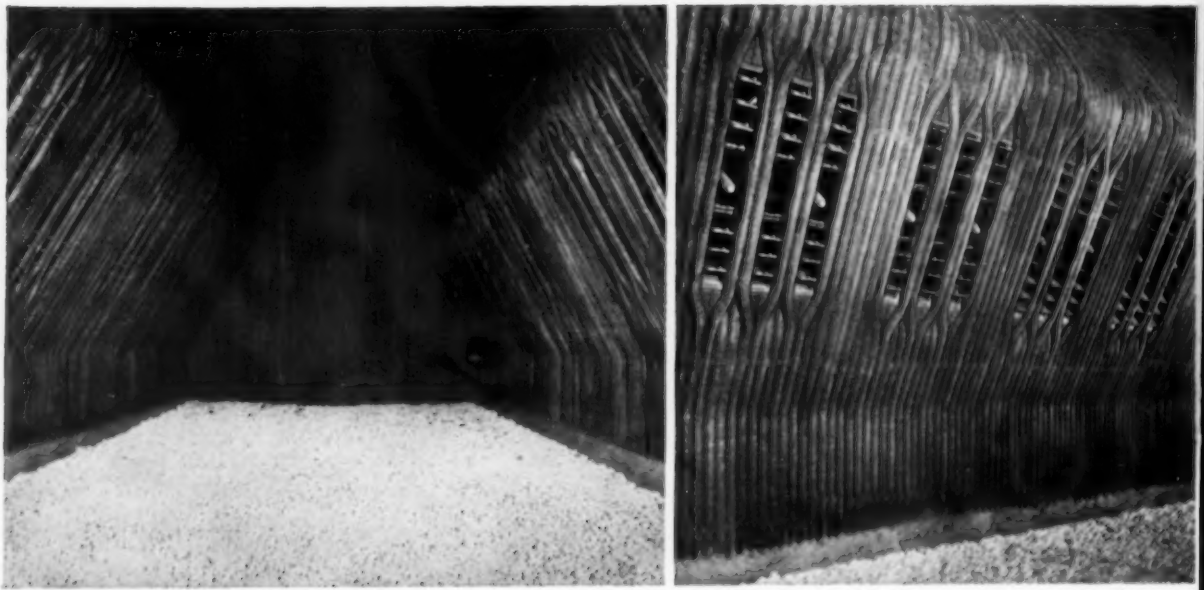
POWER PIPING—THE VITAL LINK

Specially Designed RILEY Efficiently Fire Multiple Fuels



Inside the Turbo Furnace at Sterlington Steam Electric Station of Louisiana Power and Light Co. Overall width 54′—7⅞″, depth 24′—0-3/16″. No. 1 firebrick rubble covers the furnace floor. Twenty Riley Directional Flame Burners are arranged for opposed firing on front and rear walls. Burners are shop fabricated assemblies. Burner close-up shows directional vanes, two

The Riley TURBO FURNACE unit is one of the major furnace design advances in recent years for the more efficient utilization of fuels. It is known as a multifuel unit primarily because of its ability to produce similar furnace exit gas temperatures with gas, oil, coal or other solid fuels. This phenomenum is due to the fact that natural gas, which ordinarily burns with a non-luminous flame, burns in a TURBO FURNACE with a luminous flame similar to oil and coal. In a TURBO FURNACE, fuels are burned with extremely high turbulence at the furnace bottom; in the case of pulverized coal, over a slag pool. Much of the unusual combustion efficiency is due to opposed firing with Riley Directional Flame Burners specially designed for firing multiple fuels singly or in combination. These fuels may be pulverized coal, oil, gas, or other special solid fuels such as fluid coke or lignite.

Water Cooled Burner

The Riley Directional Flame Burner is designed for opposed firing on one level. Each Riley Directional Flame Burner is installed as a unit complete with water cooling tubes which are welded to the waterwall circulation system. The waterwall tube arrangement provides maximum cooling of directional vanes, nozzles and other burner parts and reduces to a minimum the possibility of slag adhesion when coal is being burned. No burner refractories are required.

Coal Burning

Two or three burner nozzles per burner are provided when coal or other solid fuels are to be burned. In this way the coal streams are more evenly distributed across the furnace to assure good mixing of fuel and air in the furnace.

Oil Firing

A retractable type oil gun is inserted thru the center slot so as to provide complete mixing of the spray with the air stream. Oil can be burned with either steam or mechanical atomizing equipment.

Gas Firing

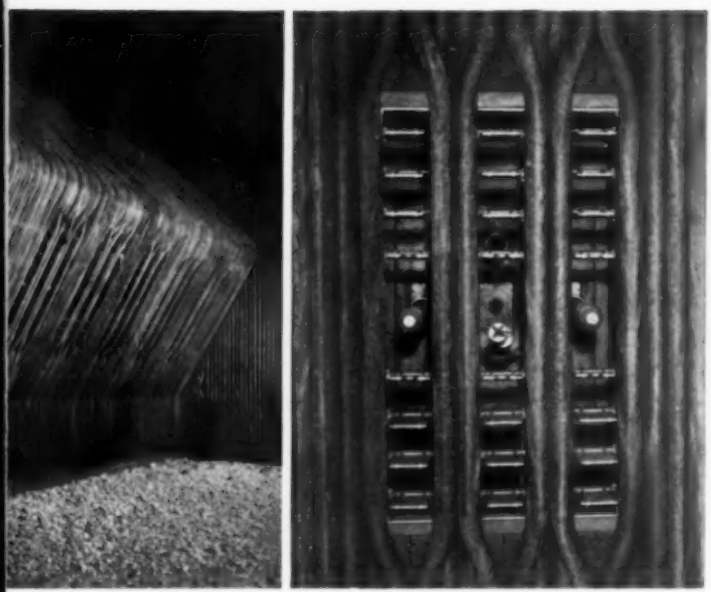
Gas is fired thru guns of high alloy stainless steel. High capacity burners have a gun in each side slot. Gas guns can be installed for mechanical retraction.

A RILEY TURBO FURNACE GIVES YOU THESE MONEY-SAVING ADVANTAGES

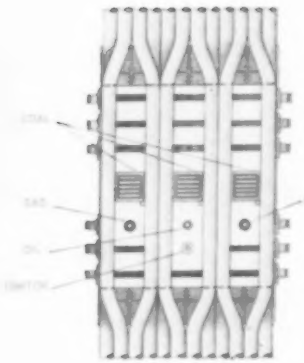
- **The ability to fire multiple fuels: gas, oil and a wide range of solid fuels**
- **A low cost and quick conversion to solid fuels with initial gas/oil firing**
- **Higher heat release with lower overall structure**
- **When firing coal**
  low carbon loss
  clean furnace, no slagging
  elimination of flyash removal with reinjection
- **One level burner operation**

TWENTY THREE RILEY TURBO FURNACE UNITS HAVE BEEN SOLD SINCE ITS INTRODUCTION IN LATE 1954!

Directional Flame Burners in a RILEY TURBO FURNACE



gas guns, gas electric ignitor, observation port. Burner can easily be converted to oil and coal firing.



RILEY
DIRECTIONAL FLAME BURNER
Pulverized Coal, Oil and Gas

Directional Vanes

Each slot is provided with directional vanes to project secondary air into the furnace so as to secure the desired placement of flame for most effective combustion. The vanes above the burner centerline and those below each have separate controls. Vanes are made of high heat resisting alloy.

Burner Shut-Off

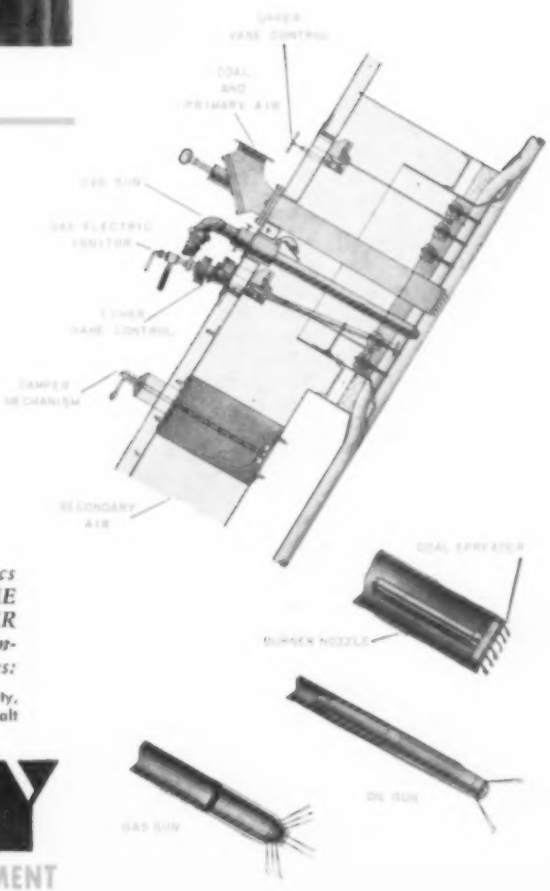
Each burner has a separate secondary air shut-off damper which can be locally or remotely controlled.

Riley Gas-Electric Ignitors

Riley Gas-Electric Ignitors are available with Riley Directional Flame Burners.

Pressurized and Non-Pressurized Operation

Riley Directional Flame Burners are designed so that they can be used either with pressurized or non-pressurized furnaces.



The complete story about the unusual operating characteristics of the Riley TURBO FURNACE and DIRECTIONAL FLAME BURNERS can be obtained by writing RILEY STOKER CORPORATION, WORCESTER, MASSACHUSETTS or contacting a Riley representative in any one of these cities:

Chicago, Cincinnati, Cleveland, Detroit, Houston, Jacksonville, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Salt Lake City, San Francisco, Seattle, St. Louis, St. Paul, Syracuse, Worcester.

RILEY
STEAM GENERATING & FUEL BURNING EQUIPMENT

For more information, use Reply Card—Page 85

MULTI-MILLION REFRACTORIES PLANT — MISS.

Pascagoula Works of H. K. Porter Now 80% Complete

With production scheduled for late in '58, construction is about 80% complete on a multi-million sea water magnesia and basic refractories plant in Pascagoula, Mississippi, for the **Refractories Division, H. K. Porter Company, Inc.**

Under the supervision of Porter, the new plant is being constructed by the **Austin Company**, Houston, Texas. **Ralph Rose** is Manager of the basic refractories project, **W. R. Shaw** is Plant Manager and **J. G. Bartel** is General Superintendent.

Expected to be one of the most modern refractory brick making operations in the country, the Pascagoula Works, using magnesia produced at the sea water plant, will produce chrome-magnesite, magnesite-chrome and periclase type basic brick in burned, unburned and steel-encased bodies. In addition, a line of chrome and periclase specialties will be manufactured: chrome cements, chrome ores, chrome ore gunning mixes, plastic chrome ore, periclase bottom mixes and periclase cements. The first chrome ore shipment from the Philippine Islands arrived in August and went into a specially prepared area.

Major application of the new plant's products will be in the field of steel (open hearth, electric furnaces, soaking pits and heating furnaces), glass (glass tank checkers, regenerator walls, etc.), cement (hot zone liners and hood covers) and non-ferrous products (copper convertors, smelters and refiners, including secondary smelting of red metal).

All major equipment has been installed for the magnesia plant, including two filters, three large rotary kilns — one for calcining dolomite, one for calcining caustic magnesia, and one for dead burning periclase.

The kilns vary in lengths from 170′ to 300′, and in diameter from 8′ to 9½′.

The seven tanks used in producing the magnesium hydroxide from sea water vary in size from 60′ to 300′ in diameter. The smallest tank is used for sea water treatment and the largest is for thickening magnesium hydroxide precipitate.

The dock, which is on a 30′ channel, will serve both plants and will handle ocean going ships, as well as barges. The main portion of the dock measures 566′ long by 50′ wide and will have a concrete surface and curb.

The Pascagoula Works utilizes the most up-to-date refractory brick making equipment available.

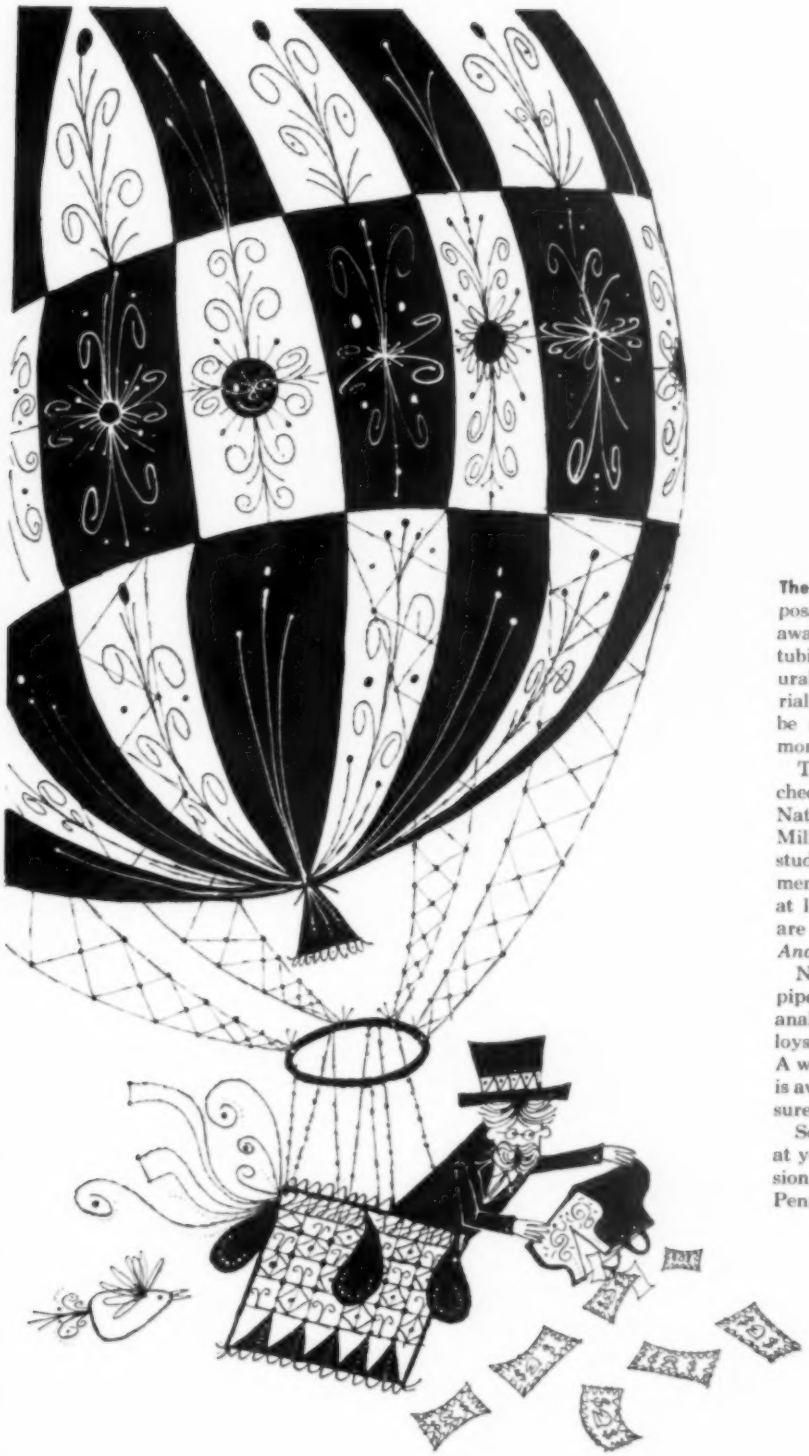
The most modern methods are used in grinding, batching and pressing brick. Controlled sized fractions will be stored in 60 bins which will supply both the brick making and specialty operations. Batching operations will be highly automated and will be controlled by one man for the entire plant. All electrical and electronic controls for the batching system will be housed and operated from a central air conditioned room.

Quaker Oats — N. C.

The Quaker Oats Company has embarked upon a new long-range feed expansion program involving construction of a number of new feed plants in areas of concentrated poultry and animal production.

The first of the new mills is underway in Asheville, N. C. with completion scheduled for September. The mill is being erected at the company's present warehouse in Asheville and will be linked with the bulk finished feed storage facilities already in operation.

The installation will include newest milling and pelleting equipment, steel bins for storing bulk ingredients and grain, automatically controlled batching equipment, grinding equipment, and packing machinery.



Who likes to throw away money?

The answer's pretty obvious. Yet there's a possibility that *you* could be throwing away money when you select pipe and tubing for paper mill applications. Naturally, you want to specify the best material for the job. But, in so doing, you might be spending money unnecessarily for a more costly tubing than you need.

The best way to avoid this is to double-check your choice of materials with National Tube. Our technically trained Mill Service Force will make a careful study of your requirements, then recommend the tubing that will do the best job at lowest cost to you. These technicians are available for consultations in the field. *And,* their help won't cost you a cent.

National Tube manufactures seamless pipe and tubes in a complete range of steel analyses from low carbon through the alloys up to and including stainless steels. A wide range of sizes and wall thicknesses is available for every mechanical and pressure purpose.

Service is our business. Let us serve *you* at your convenience. National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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"The world's largest and most experienced manufacturer of tubular products—National Tube"

National Tube Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • United States Steel Supply Division • United States Steel Export Company, New York

as at Lever Brothers begins with a

LEVER BROTHERS COMPANY
LOS ANGELES

Here's the expected performance of seven OTIS Freight Elevators at the LEVER BROTHERS COMPANY plant at Los Angeles. Five 10,000 pound duty cars are constantly carrying raw material up from the ground floor for gravity processing. One of these cars and a 4,000 pound duty car are used for warehousing finished products. Another 2,500 pound duty car handles material for the laboratory and doubles as a passenger car to the cafeteria.

OTIS Maintenance—through the local OTIS office—assures trouble-free elevator service at LEVER BROTHERS.

Trouble-free freight elevator service starts with a FREE Otis Maintenance Survey and Estimate. Our approach is illustrated at the right.

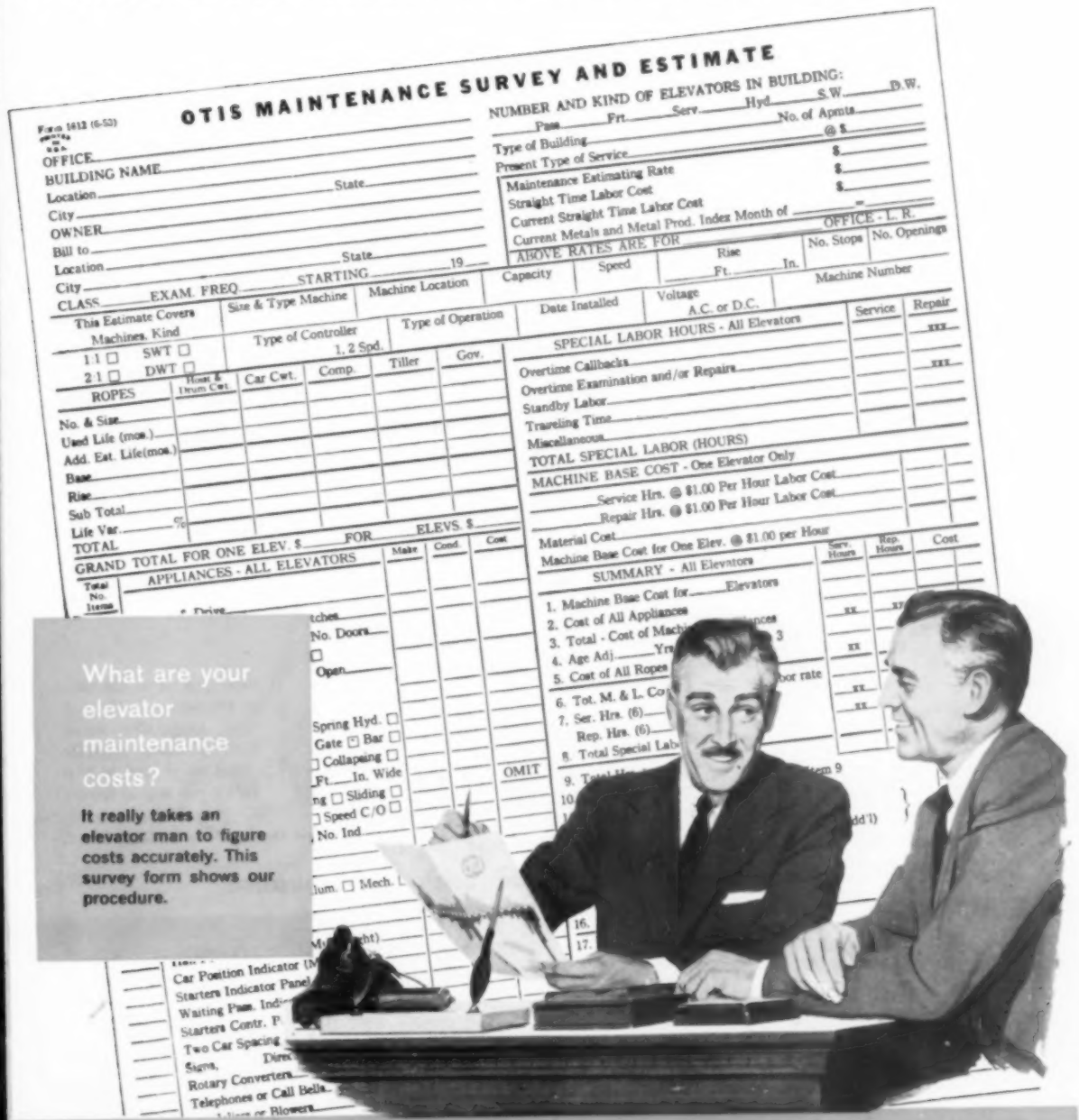
In addition to freedom from shutdown costs, you'll be freed of unexpected, expensive repair bills. There's just one fixed monthly charge. It can be budgeted. It's adjusted annually, up or down, on labor and material costs only. And never because of the age or condition of the equipment.

Otis **freight elevator**

"ENGINEERED SERVICE BY THE MAKER"

OTIS ELEVATOR COMPANY • 260 ELEVENTH AVENUE • NEW YORK 1, N.Y.

trouble-free elevator service
FREE OTIS maintenance SURVEY


OTIS MAINTENANCE SURVEY AND ESTIMATE
What are your elevator maintenance costs?
It really takes an elevator man to figure costs accurately. This survey form shows our procedure.

maintenance "that keeps freight elevators running like new"

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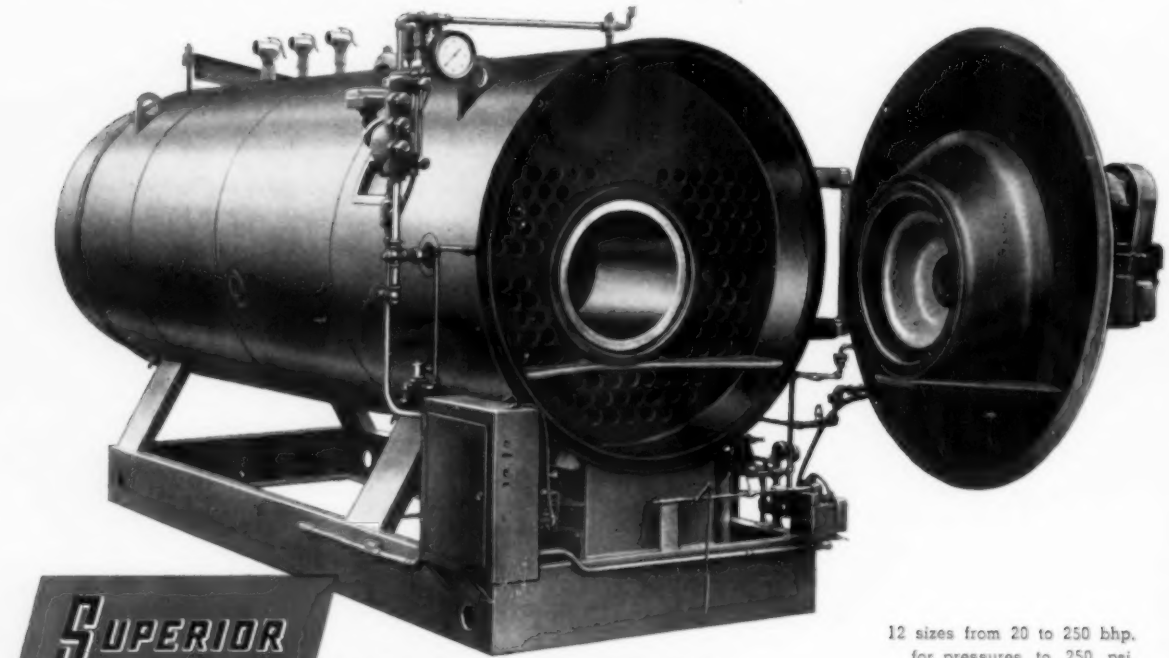
SO EASY TO MAINTAIN ITS NEW EFFICIENCY



SUPERIOR "COMPACT"

12 sizes from 20 to 250 bhp. for pressures to 250 psi. or for hot water. Fully automatic operation firing oil or gas or both. Before you buy or specify any packaged boiler, get the details in Bulletin 1011-C

all the big boiler features you want combined with accessibility and easy maintenance

With a full 5 sq. ft. of heating surface per bhp., 4-pass, down-draft design, and built-in induced draft, the Superior COMPACT is a highly efficient and dependable package. Its efficiency, guaranteed by factory-fire-test of every unit, insures years of economical performance; for the Superior COMPACT is planned for the easy maintenance which sustains high efficiency.

Front doors are hinged, and rear doors hinged or davited to simplify inspection and cleaning. But note that no belts or mechanical components are located inside the front door where they would be subject to the heat of the fire. All units firing #4, #5 and #6 oil are equipped with dependable Superior Rotary Burners. High in the shell, and protected by the tubes of the fourth pass, the furnace is away from the "danger zone" eliminating the possibility of bagging or blistering.

Specialists in **PACKAGED BOILERS... exclusively**

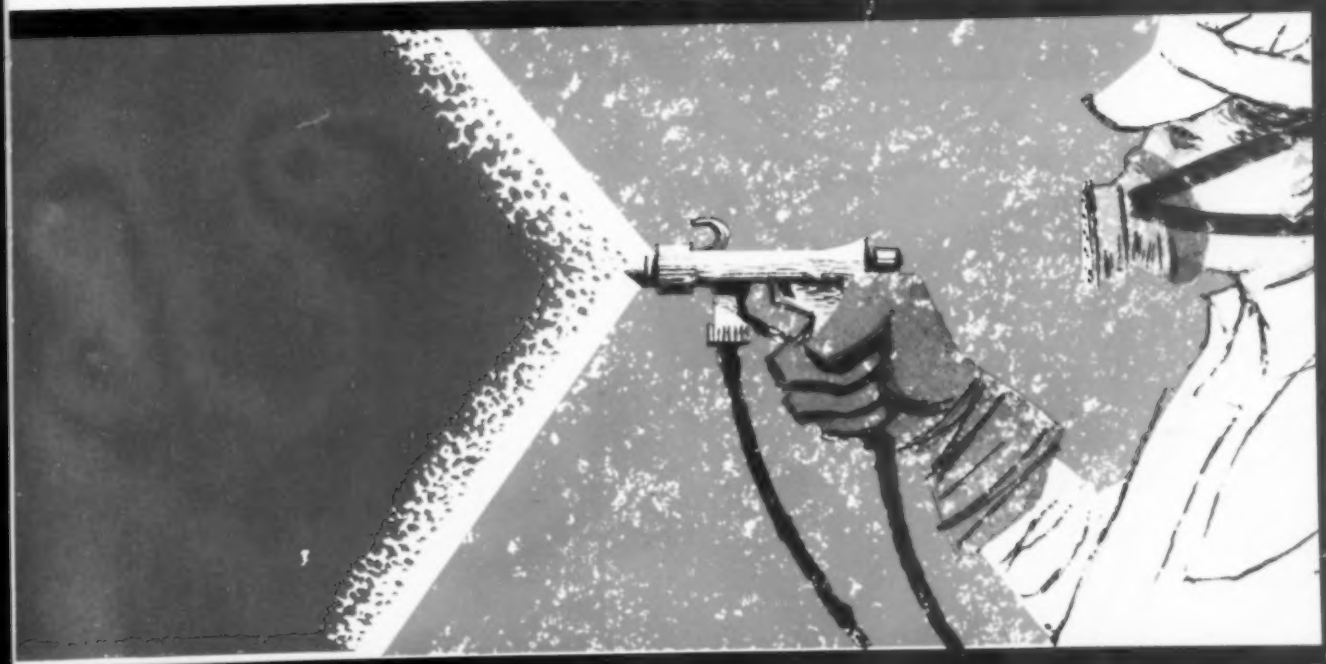
SUPERIOR COMBUSTION INDUSTRIES INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

SUPERIOR PACKAGED BOILERS

NEW

GULF METALCOAT A

protects against rust and corrosion up to 10 times longer



9 years of intensive test exposure prove that new

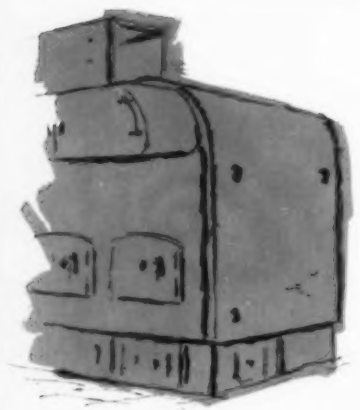
GULF METALCOAT A

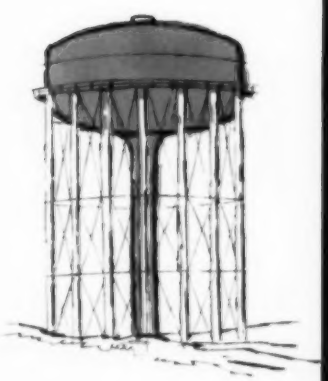
- **protects metal surfaces against rust and corrosion up to 10 times longer**
- **protects under the most severe exposures in industrial and marine atmospheres**
- **is easy to apply by brushing, spraying or dipping—to either smooth or rough surfaces**
- **is unaffected by temperature changes**
- **resists the abrasion of normal handling—yet can be easily removed by a petroleum solvent**
- **costs less**

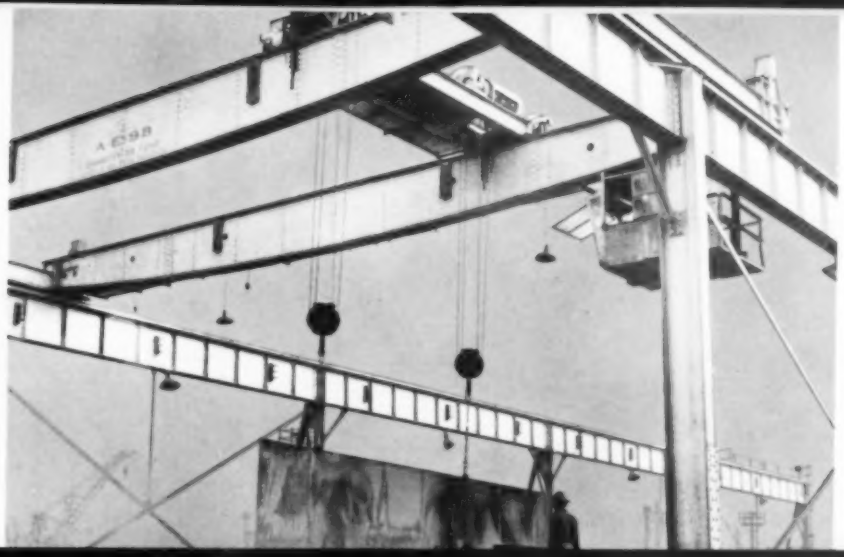
New Gulf Metalcoat A is a revolutionary new aluminum pigmented liquid coating that has been passing the most rugged marine and industrial tests for 9 years! Salt spray tests at Wrightsville Beach, N. C., revealed that Gulf Metalcoat A gives from 7 to 10 times greater protection than that afforded by competitive products. In a Philadelphia shipyard, overhead cranes have been perfectly protected by Gulf Metalcoat A for 4 years. Ships have used the new coating on stacks and other exterior surfaces exposed to salt spray atmosphere—with outstanding success.

For long-lasting protection, use new Gulf Metalcoat A on piping, fences, storage tanks, sheet metal buildings, metal roofs, machine parts, land transportation equipment, ships, barges, stacks and other marine applications.

For temporary protection during storage or shipment, Gulf Metalcoat A is excellent for structurals and steel components of all kinds.

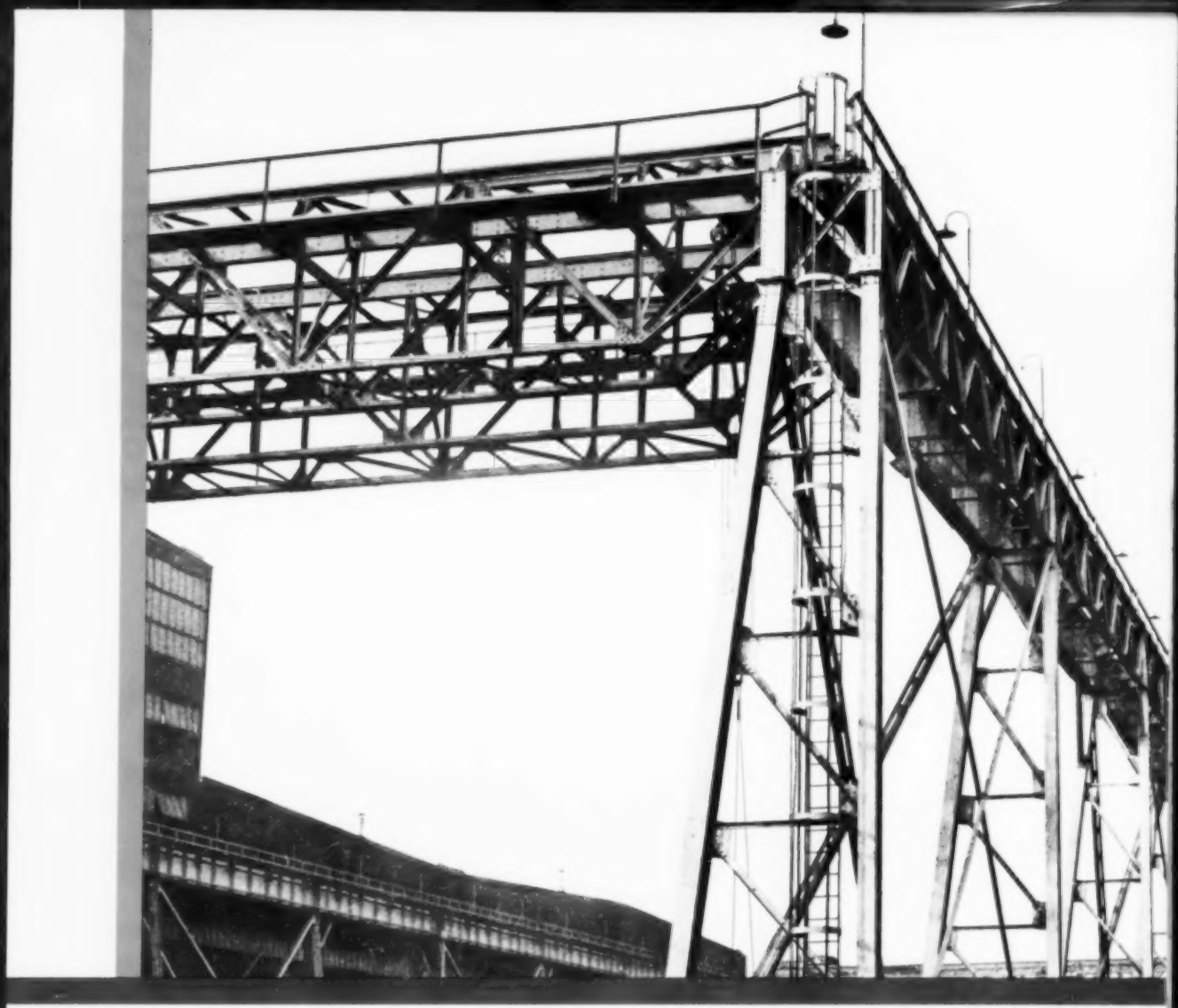






Gulf Metalcoat A has protected this steelwork for 4 years—above sulfuric acid pickling tanks! Coating is still in excellent condition.

These building exhaust ventilators, located in a corrosive atmosphere, are kept free from rust and corrosion by Gulf Metalcoat A.



After 2 years' exposure, Gulf Metalcoat A is sti
giving exceptional protection to the structural steel
work supporting this 40-ton overhead traveling crane

GULF METALCOAT A is available now

Gulf Metalcoat A is now available through your Gulf Sales representative. For more information, call your nearest Gulf office, or mail the coupon.

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Dept. DM, Gulf Building
Pittsburgh 30, Pa.

Please send me price information on new Gulf Metalcoat A.

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Company_____
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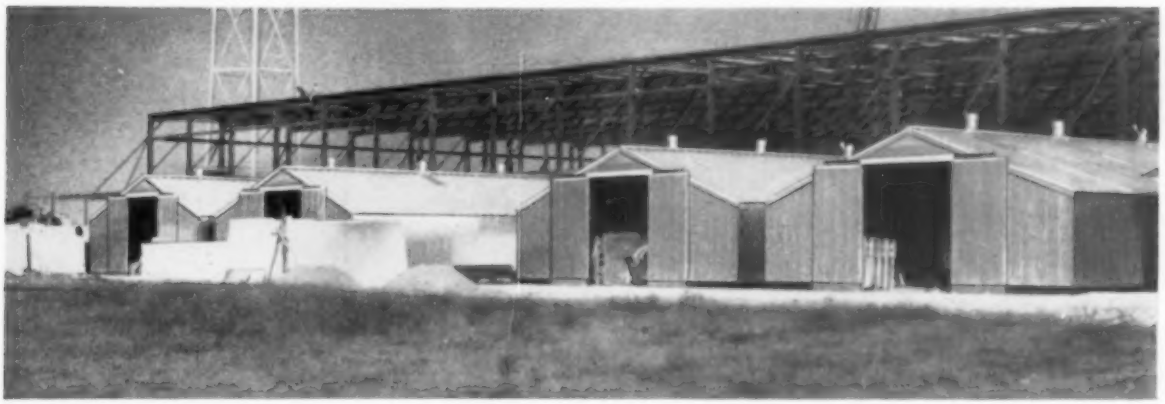
GULF

How a Contractor and a Manufacturer Saved Money with an Armco Steel Building



Four Armco Steel Utility Buildings, in foreground, provide shelter for textile machinery while the new Carlisle Finishing Company plant is being completed. Later, they were dismantled and moved to other cities for re-erection on permanent sites.

Consulting Engineer:
J. E. Sirrine Company,
Greenville, South Carolina

When Carlisle Finishing Company, Carlisle, South Carolina, drew up plans for a new plant, the company and the building contractor made a novel agreement that saved money for both of them!

The contractor, Daniel Construction Company, Inc., of Greenville, South Carolina, put up an economical 70- x 140-foot Armco Steel Building for their use during construction of the main plant. After construction work was completed, the Armco Building was turned over to Carlisle, a division of Cone Mills Corporation, textile manufacturers of Greensboro, North Carolina. Now it's a permanent warehouse.

On the same project, company officials had the problem of storing textile machinery arriving before the plant was completed. As a solution, they erected four Armco Utility Buildings, each 36 by 48 feet, adjacent to the site for this purpose. After the new plant was completed, two of the buildings were dismantled, moved about 150 miles to Greensboro, North Carolina, and re-erected at the owner's White Oak Plant. The other two buildings were also dismantled and sent to the Greenville, South Carolina, plant to be used for storage.

In each case, an Armco Building provided shelter at the construction site and was later used as a permanent structure for another purpose.

* * *

Armco Buildings, with their all-bolted construction that simplifies erection or re-erection, are one of the more than 30 Armco Drainage and Construction Products for industrial, municipal, highway and railway applications. Write for data.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
DIXIE DIVISION
P. O. Box 1343 • Atlanta, Georgia
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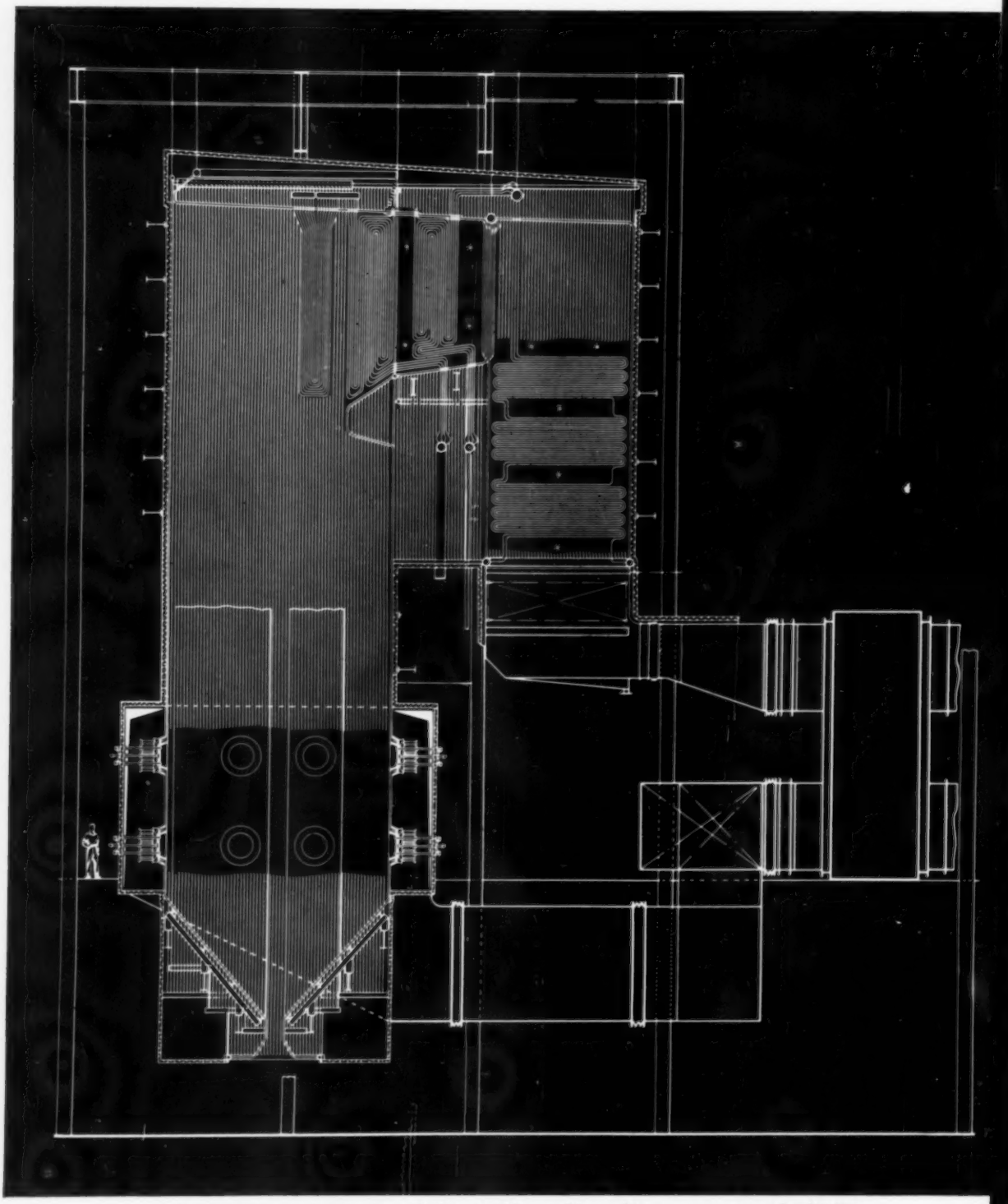
Other Offices in Principal Cities

This Armco Steel Building was purchased by the Carlisle Finishing Company to serve as shop, office and equipment storage for the contractor. According to plan, it was later used as a warehouse by the owner.

These Armco Utility Buildings are shown here after being dismantled, moved 150 miles, and re-erected at another of the owner's plants.

Armco Construction Products

A Big Step Forward-



Newest UP unit for Southern California Edison will provide steam at a rate of 1,638,000 lb per hour to a 210,000 kw turbine at a pressure of 2,400 psi and at a temperature of 1,050/1,000 F. Completion of the unit, which will burn either natural gas or oil, is scheduled for November, 1960.

Why Southern California Edison Purchased B&W Universal Pressure Boiler for 2400 PSI Operation

Once-Through Unit Reduces Capital and Operating Costs —Makes Use of Variable Pressure Possible

A big forward step in holding the line on the cost of producing electricity was taken by Southern California Edison in purchasing two B&W Universal Pressure units for its station at Huntington Beach, California.

Solid savings both in installed first cost and in operation stand behind this decision. Here are the facts:

INSTALLED COST

1. The overall cost of a Universal Pressure Boiler represents a saving over a drum type boiler for identical conditions.
2. Because height and weight of the UP Boiler are much less than those of drum type boilers, there are worthwhile savings in building and construction costs.
3. Superheat, hot reheat and cold reheat steam piping are reduced.
4. Foundation costs reduced because of 650 ton saving in weight of unit.
5. Drum transporting and lifting costs eliminated.
6. One level of stairs, walkways and elevator landing eliminated.

OPERATION

Many significant advantages from the UP's unique operating features helped shape Southern California Edison's decision. Here is what they found:

1. Constant steam temperature at all loads without use of tempering equipment.
2. Rapid response to load change.
3. Quick start up and shut down.
4. Simplified control system during normal operation.
5. Minimized operating complications when turbine is tripped.
6. Complete flushing of preboiler and boiler system is accomplished during every start up and shut down.
7. Reduced dependence on safety valves.
8. Elimination of water level gauge glasses and indicators.
9. Ease of acid cleaning.

VARIABLE PRESSURE OPERATION

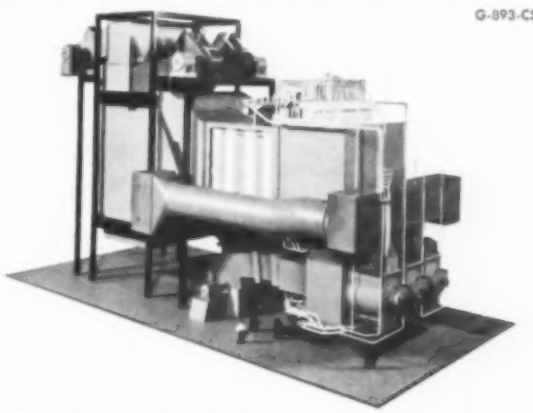
The Universal Pressure Boiler can be operated with variable pressures and constant steam temperature over a wide load range. This not only means more efficient operation at partial loads, but also cuts auxiliary power requirements at lower loads.

The Universal Pressure Boiler helps the utilities' pressing need to hold the line on most of the important factors affecting cost of power generation.

Behind its many benefits stands the concrete performance of America's first successful commercial application of the Universal Pressure principle at the Philo Plant of the Ohio Power Company on the American Electric Power System. This unit has had a full year of performance under diversified conditions. Performance, ease of operation and freedom from major troubles have exceeded even the optimum original expectations.

We would be glad to discuss with you the advantages that the Universal Pressure Boiler can bring to your plant. Write to The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

G-893-CS



Model of the first Universal Pressure Boiler, which is now operating, uses once-through principle by which water, under pressure, is forced in one end of the system and emerges at the other end as superheated steam. This principle eliminates need for a drum.

BABCOCK & WILCOX

BOILER DIVISION

TVA — Widow's Creek

With delivery scheduled for late 1959, boiler feed pump turbines for the world's largest steam electric power generating unit have been ordered by the Tennessee Valley Authority from General Electric's Small Steam Turbine Dept. Turbines will operate with a 500,000 steam turbine-generator unit which will be installed in TVA's Widow's Creek station at Bridgeport, Alabama.

Each boiler feed pump turbine is rated 10,000 hp, 6600 rpm, and will take steam from the "cold" reheat line at 487 psia at 647 F. The turbines are also designed for high pressure inlet of 2400 psi at 1050 F steam for initial starting and low-load operations.

The boiler feed pump turbines at the Widow's Creek station will permit a decrease in the "unit" auxiliary electrical requirements. Most steam turbine-generator units of 200,000 kw and up use large amounts of electricity generated in the station to operate motors to drive the boiler feed pumps. By employing steam turbines as the prime mover, the electricity normally used by the motors can become saleable kilowatts.

Foster Wheeler Corporation will supply the feedwater heater system. $750,000 system, the largest ever built by Foster Wheeler, will heat the entire feedwater requirements for an output of 3,850,000 lb/hr. Cycle will contain three all-welded high pressure heaters with a water-side pressure of 3250 psi. Two twin low pressure heaters (300 psi) will also be employed along with two single low pressure heaters connected in series.

Alabama Implement Manufacturer Starts $150,000 Expansion

The Bush Hog Manufacturing Co., of **Selma, Alabama**, makers of the Bush Hog heavy duty rotary cutter and some 50 other different types of tractor-powered agricultural implements, is underway on an $150,000 expansion program which will increase the size of the present plant to about 65,000 sq ft.

Westinghouse Shipping Transformers from New Multi-Million Georgia Plant

Westinghouse presents the first distribution transformer built at the Company's new plant in Athens, Georgia, to top officials of the Southern Company and Georgia Power Company. In the usual order — J. R. CARMICHAEL, manager of purchases and stores and J. J. McDONOUGH, president of Georgia Power; OTIS O. RAE, vice president in charge of the Westinghouse southeastern region; and C. B. McMANUS, chairman of the board, Southern Company.

One of the largest Westinghouse facilities in the entire South and the most modern of its kind in the electrical industry is now producing pole-type distribution transformers for electric utilities and industries throughout the South.

Westinghouse Electric Corporation's new ultra-modern manufacturing building is a one-story structure on a 254-acre site near Athens, Georgia. There are more than 622,000 sq ft devoted to factory and office sections. Around 23,500 ft of conveyor lines extending throughout the plant transport miscellaneous parts as well as entire transformers through various stages of assembly.

Component production began in January and the first completed transformer came off the line in March. About 250 are now employed and by the end of the year about 400 are expected to be on the payroll.

Vepco Expansion

Virginia Electric and Power Company has ordered a new $5 million, 200,000 kw controlled circulation boiler from **Combustion Engineering** to be installed at the Possum Point Station on the Potomac River at Quantico, Virginia. It will be the eighth controlled circulation unit purchased by Virginia Electric and will be the largest boiler in the company's system.

Stone and Webster Engineering Corporation is serving as consultants for Vepco on the new project as it has on the seven preceding installations.

Vepco also recently contracted with **Leeds and Northrup Co.** for a $64,000 generator-type computer and automatic control equipment. Computer will be used as an extension to the utility's present control system in the load dispatcher's office at Richmond. Five stations will be provided with equipment to modernize their present system — Chesterfield, Portsmouth, Bremo, Yorktown and Possum Point.

New Metalworking Plant for Ark.

The acquisition of a plant in **Fort Smith, Arkansas**, for the manufacture of Duplex tool boxes, has been announced by **Pendleton Tool Industries, Inc.** The former site of Duplex, in Sherman, New York, was razed by fire last March.

Duplex Manufacturing Corporation, a wholly-owned subsidiary of Pendleton Tool Industries, has been marketing a quality line of tool boxes for the past 25 years. The new plant, covering 18,000 sq ft on a 3 acre site on the Missouri Pacific, is strategically located for national distribution. New machinery and equipment has been installed which will enable Duplex to increase production and improve the designs of this well-known box line.

Duplex is one of eight plants in the nationwide Pendleton Tool Industries complex which includes such famous brand names in the hand tool field as Proto, P & C, Challenger and Fleet.

SAVINGS FOR *YOU* *AND* YOUR COMPANY

no maintenance with the *first* fully self-contained *mechanical pilot* operated steam pressure reducing valve

THE ALL NEW LESLIE-TOPPER assures you reliable, year 'round control in continuous, intermittent or stand-by service. Check these features available in *no* other valve.

- PACKLESS • METAL DIAPHRAGM • STELLITED STAINLESS STEEL SEAT RING
- SINGLE SEATED • STAINLESS STEEL MAIN VALVE HARDENED TO 500 BRINELL
- INLET PRESSURES: 7-250 PSI • REDUCED PRESSURE RANGES FROM 2-35 PSI

If this valve doesn't give 100% satisfaction and prove to be better in every way than any valve you have ever used in this service your money will be refunded in full.

Order from your local Leslie distributor now and eliminate reducing valve headaches during the coming *heating* season.

LESLIE

REGULATORS and CONTROLLERS

LESLIE CO., 261 Grant Avenue, Lyndhurst, New Jersey

For more information, use Reply Card—Page 85

From pit to plant, LeTourneau—

New 400 HP LW-80—world's largest coal hauler—is 12' high by 12' wide, 54½' long. It hauls 100 cubic yards (80 tons) per trip at speeds up to 34 mph.

Westinghouse moves with coal

Earthmoving equipment manufacturer estimates steam generated from coal costs only half as much as competitive fuels

At LeTourneau-Westinghouse Co., Peoria, Ill., steam is used to heat an area that has swelled to a million square feet of space. Increasing demand created the need for a modern heating plant to replace obsolete equipment. When plans were drawn for the new plant, fuel surveys indicated that the firm should continue to use coal for availability and economy. Estimates showed that steam produced from burning coal in this area costs about *half as much* as from competitive fuels.

Today LeTourneau-Westinghouse has found that burning coal in modern equipment cuts costs in several ways. Fuel costs, of course, are at a minimum. Automatic, efficient operation has lowered coal and ash handling costs. And manpower requirements have been reduced from 12 to 7 men.

Facts you should know about coal

You'll find that bituminous coal is not only the lowest-cost fuel in most industrial areas, as in the case of LeTourneau-Westinghouse, but up-to-date coal burning equipment can give you 15% to 50% more steam per dollar. Today's automatic equipment can pare labor costs and eliminate smoke problems. And vast coal reserves plus mechanized production methods mean a constantly plentiful supply of coal at stable prices.

Technical advisory service

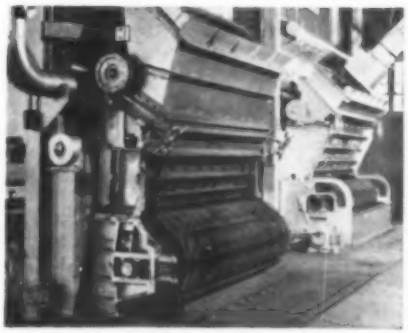
To help you with industrial fuel problems, the Bituminous Coal Institute offers a free technical advisory service. We welcome the opportunity to work with you, your consulting engineers and architects. If you are concerned with steam costs, write to the address below. Or send for our case history booklet, complete with data sheets. You'll find it informative.

Consult an engineering firm

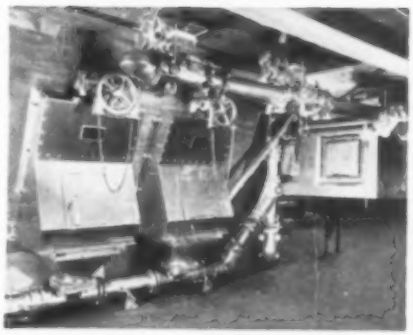
If you are remodeling or building new heating or power facilities, it will pay you to consult a qualified engineering firm. Such concerns—familiar with the latest in fuel costs and equipment—can effect great savings for you in efficiency and fuel economy over the years.

BITUMINOUS COAL INSTITUTE

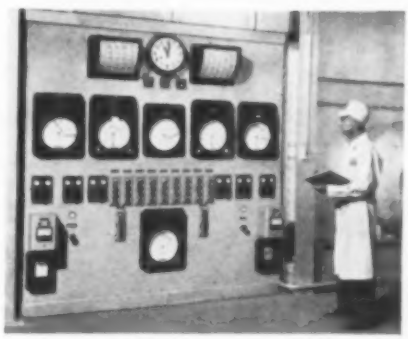
Department SP-09
Southern Building, Washington 5, D. C.



View in the LeTourneau-Westinghouse heating plant. In foreground is an Erie City 40,000 lb/hr type I.W.T. boiler which is used on stand-by basis and for peak loads in extremely cold weather. At the right rear is Erie City 60,000 lb/hr main boiler. Both are fired by Combustion Engineering Inc. traveling grate stokers.



Shown are ash hoppers, part of United Conveyor ash handling system. Ashes are dumped from ash pits into hoppers from where they are piped pneumatically to silo. This system also handles dust from Prat-Daniel dust collectors.



Bailey Control Panel regulates both boilers, including boiler meters and recorders, feedwater controllers and alarms, drum level recorders and alarms, multipointer gages for draft control and return condensate recorders.

New heating plant showing 9000 cu ft Kalamazoo Tank & Silo Co. coal silo (on right). Coal feeds from railroad car into track hopper, then moves by screw conveyor to 40 ton/hr bucket conveyor which elevates coal to top of silo. Entire coal handling system by Beaumont-Birch Co. To left of coal silo is Kalamazoo 25-ton ash silo equipped with United Conveyor dustless rotary unloader.

New Louisville Bldg. — Reynolds Al. Supply

Reynolds Aluminum Supply Company, a Reynolds Metals Co. subsidiary, is now building a new 53,500 sq ft combination office and warehouse building on Fern Valley Road in **Louisville, Kentucky.** Harpring Sales & Erectors, Inc., of Louisville has the erection contract.

Reynolds Aluminum Supply Company has headquarters in Atlanta, Georgia and offices and warehouses in ten key cities in the Southeast.

Included in the building will be office space for approximately 30 employees, a display sample room, and warehouse space for aluminum mill products, aluminum building products, and other materials for builders and metal fabricators. Facilities will include power shears and slitters to cut metal to customer requirements.

The present Louisville headquarters of Reynolds Aluminum Supply Company are at 1239 South Tenth Street.

Water Cooled Generators for W. Va. Station

General Electric Company is building the nation's first steam turbine-driven generator with water-cooled stator windings — a new design which affords the possibility of generator ratings conceivably as high as 1,000,000 kva.

Water cooling will be used in the two 265,000-kva generators of the 450,000-kw, cross-compound steam turbine-generator unit being built for the **Philip Sporn** Plant of the American Electric Power System at **Graham Station, W. Va.**

The Large Steam Turbine-Generator Department foresees water cooling resulting in not only double the generator ratings now possible with conventional cooling within the same frame size, but also significant savings in power plant construction costs. In addition, much higher-rated generators can be built and installed within the limitations on physical size and weight presently imposed by current shipping restrictions.

ASME-AIME SOLID FUELS CONFERENCE OCT. 9-10, OLD POINT COMFORT, VA.

The 21st Annual ASME-AIME Joint Solid Fuels Conference is scheduled for **October 9-10, 1958** at the famous Chamberlin Hotel at Old Point Comfort, Virginia.

General theme of the conference is "The Export Coal Market" and will be highlighted by a waterside tour of the coal loading facilities of the three Pocahontas coal-carrying railroads — The Chesapeake and Ohio, Norfolk & Western, and the Virginian Railway Company.

Conference Chairman, **Edward E. Williams,** Vice President, Duke Power Company, will preside at the opening day luncheon Thursday, October 9, at which time **S. Pemberton Hutchinson,** Executive Vice President, General Coal Company of Philadelphia will speak on "The Export Coal Market."

Conference Co-Chairman, **George G. Ritchie,** Coal Traffic Manager-Engineering, The Chesapeake and Ohio Railway Company, Richmond, Va., will preside at the second day luncheon, Friday, October 10, at which time **Dr. Theodore Baumeister,** Stevens Professor of Mechanical Engineering, Columbia University, will deliver an address relating the impact of atomic power development to the long-term outlook for solid fuels.

ASME National President, **James N. Landis,** Vice President, Bechtel Corporation, will preside at the Annual Banquet on Thursday evening, October 9. An outstanding electric utility company executive, **C. S. Reid,** Vice President, Duke Power Company, Charlotte, N. C., will be the featured speaker and will deliver an address entitled, "Changing Times."

Technical program highlights of special interest to Southern industry include:

"Coal Level Controls and Stoppage Alarms" — Arthur Stock, President, Stock Equipment Company, Cleveland, Ohio.

"Pneumatic Coal Handling Systems" — Walter Gruca, Mechanical Engineer, Standard Forgings Corporation, Chicago, Ill.

"Handling and Disposing of Combustion Refuse From Solid Fuels" — L. E. Mylting, Vice President, The Allen - Sherman - Hoff Company, Wynnewood, Pa.

"Dock Handling of Bulk Materials" — R. C. Tench, Materials Handling Engineer, The C&O Railway Co.

"Equipment and Procedure for Carload Sampling" — A. Burr, Cleveland Electric Illuminating Co., and W. R. Reichenstein, Fairfield Engineering Co.

"Drying of Coal" — Charles Gordon, Manager, Raymond Div., Combustion Engineering, Inc.

"Correlation of Free Swelling Index of Bituminous Coals with Other Standard Tests" — H. J. Rose, Vice President, Bituminous Coal Research.

"First Cyclone Furnace Fired Boiler in Southeast" — W. L. Bross, Chief Engineer, Greenwood Mills, Greenwood, S. C.

"Start-Up and Operating Experience With Coal and Delayed Coke Fired Utility Boiler" — Sam C. Brown, Jr., Efficiency Engineer, Virginia Electric and Power Company, Yorktown, Va.

For More Info . . .

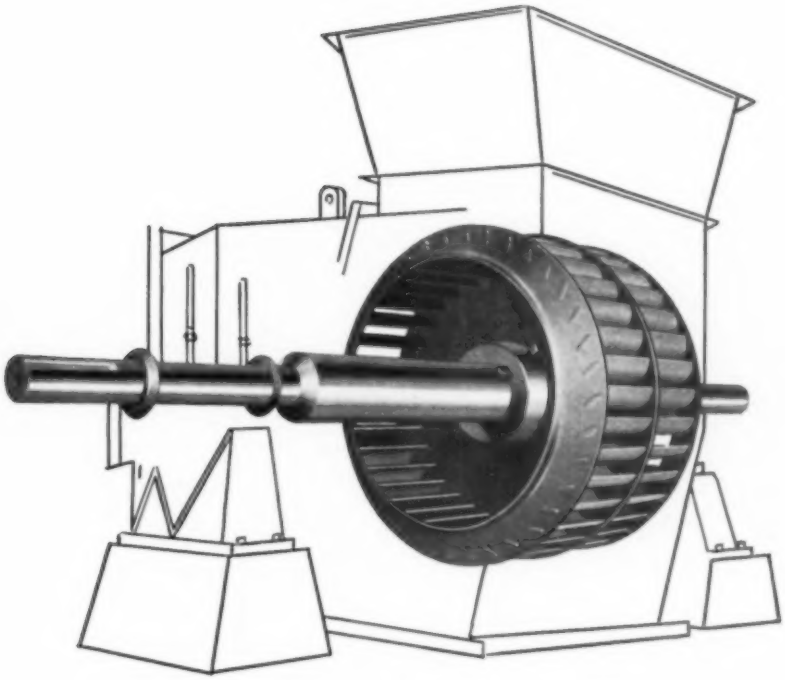
For complete program data contact **Carl S. Dennis,** Fuel Service Engineer, The Chesapeake and Ohio Railway Co., 823 E. Main, Richmond, Virginia.

Mr. Dennis, Chairman of the Virginia Section, ASME, heads up the publicity committee for the '58 Joint Fuels Conference.

New Florida M&R Shop — Westinghouse

A new manufacturing and repair plant will be built by **Westinghouse Electric Corporation** in Baldwin, Fla., 20 miles west of Jacksonville.

The company has exercised its option to purchase 4.5 acres of land on the east side of Baldwin for the location of the new facility. The building probably will be of brick, concrete block, and steel construction, and will house about 18,000 square feet of shop and office space.



CLARAGE TYPE DN DYNACURVE FAN OFFERS A

New Concept

IN INDUCED DRAFT WHEEL DESIGN

36 radially deep, aerodynamically curved blades impart a dynamic energy to the gas stream to achieve low tip speed operation.

Unique shape of the blades and rims minimizes shock losses and turbulence at the entering edge of the blades and between the blades.

Wheel design assures relatively low moment of inertia (WR^2).

Wheel is constructed with a heavy forged steel hub and a sturdy centerplate.

All welded construction of the wheel provides ample shear strength, tensile strength, and rigidity.

These are only a few of the features that make Clarage's new Type DN Dynacurve Fans fully equal to the most punishing demands.

Write today for Bulletin 905. CLARAGE FAN COMPANY, Kalamazoo, Michigan.

CLARAGE ... *dependable equipment for making air your servant*

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

Looking for cost leaks? Look at your steam traps

Engineering approach to steam trapping can save thousands a year on costs of fuel, trap maintenance, process cycle time, and uniformity of product quality

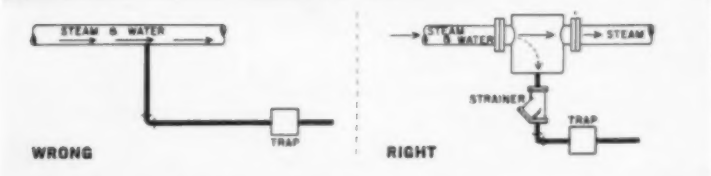
Plant and process engineers all across industry have found that Sarco *Production-Planned* steam trapping can pare operating costs by thousands of dollars a year.

Production-Planned steam trapping is an engineering approach to the problem of getting full design values of heat transfer from steam using equipment. Scores of case histories show that it can make substantial savings and improve processing efficiency. At the same time, costly trap maintenance can be greatly reduced.

In Sarco *Production-Planned* steam trapping, traps are matched to the job by *type* as well as size. They are properly placed, correctly installed. And, to keep down maintenance and replacement costs, every trap is top-quality.

It may pay you well to take this engineer's-eye view of *your* steam trapping. And why not have a Sarco representative look over your system with you? His suggestions will be completely objective because Sarco—and only Sarco—makes a steam trap for every basic requirement. Quality? Recognized everywhere for half a century.

Production-planned systems make best use of traps



As the two illustrations above show, correct application of steam traps is as necessary as using the right trap. In the hook-up on the left, the lack of a condensate collection point plus the long leg to the trap will result in condensate's flowing past the drain point, possibly causing water hammer. The correct way to install the trap is shown at right, placed close to the drain point. A *strainer* should be placed before *any* trap to prevent entrance of scale or other foreign matter into the trap.

This is just one example of the way your Sarco representative can help you plan your steam system for maximum production.

Traps must be matched to job for best system performance

No single type of steam trap will perform well in all applications. Each type has a range of applications for which it is best suited. For optimum efficiency these differences must be taken into account; traps must be chosen for their operating principles as well as their size and pressure rating.

Sarco can give you impartial help in selecting traps because only Sarco makes the five basic types. With Sarco, it's simple —one source, one responsibility, for all your trapping needs.

Only Sarco makes these five basic types of steam traps

Thermo-Dynamic*

Thermostatic

Liquid Expansion

Float-Thermostatic

Camlift Bucket

5579

Take these two steps to Production-Planned steam trapping:

(1) Write today for Sarco literature; (2) Talk with your Sarco representative. He can help you check your trapping requirements, and he has—or will quickly get—the right answer to any unusual trapping problem.

*T.M.U. Pat. No. 2,817,353.

SARCO

COMPANY, INC.

635 Madison Ave., New York 22, N. Y.

STEAM TRAPPING • AIR VENTING • TEMPERATURE CONTROLS • HEATING SPECIALTIES

For more information, use Reply Card—Page 85

PLANT PERSONNEL

Engineering-Management Promotions Announced by Major Southern Plants

Alma V. Wafer, recently with Ohmstede Machine Works, Beaumont, Texas, is now Utility Superintendent, Maintenance Department of **Copolymer Rubber & Chemical Corporation,** Baton Rouge, La. Copolymer's new $3 million plant produces a dry rubber product containing carbon black.

William J. Neuhauser is now plant manager and **Edward J. Siewert** is assistant plant manager of **Reynolds Metals Company's** foil rolling plant in Louisville, Ky. They have transferred from the foil rolling (South) plant in Richmond, Va. Mr. Neuhauser succeeds **Frank Ballard,** who has been transferred to Richmond as technical staff assistant to the division manager.

At the South Plant in Richmond **James Burnam,** formerly plant industrial engineer is now staff assistant to plant manager **John Wood. Albert Fruchtenicht** is plant superintendent in charge of foil rolling operations, and **Frank H. Lively** is general foreman.

Lester Ulm, Jr. is General Engineer of **Tampa Electric Co.** and **Alex B. Hull, Jr.** has been appointed head of the Distribution Engineering Section.

Edward A. Toomey has succeeded **Ressler A. Dusseau** as manager of the **Yale & Towne Manufacturing Company's** plant at Forrest City, Arkansas. The Arkansas plant manufactures the complete Yale lines of hand lift trucks and hand hoists. Mr. Dusseau has been named special assistant to Yale & Towne President.

F. G. Gronemeyer, nylon plant manager of the **Chemstrand Corp.** at Pensacola, Florida, has been elected a vice president of the company.

Astor L. Thurman is now manager of the West Virginia Works of **Connors Steel Division.** Plant is located in Huntington, West Virginia. Mr. Thurman joins Connors from Mannesmann-Meer Engineering and Construction Company of Easton, Pa.

Howard W. Bennett, who has served in various capacities in the Houston mill since 1942, has been appointed assistant superintendent of steel production for **Sheffield Steel Corporation.** Mr. Bennett will be in charge of the electric furnace shop.

Richard R. Evans, Jr. is superintendent of **General Electric's** new apparatus service shop, recently opened in Miami, Florida.

CP&L Starts 6th Cape Fear Unit

Carolina Power & Light Company added 235,000 hp to its generating capacity recently when a sixth unit went on line at its Cape Fear station. Its distinction as the system's largest unit will be short-lived as another 250,000 hp project is already underway at Hartsville, S. C.

CP&L's expanding generating capacity — now totaling 1,750,000 hp — follows a post-war pattern which has involved $200 million in new investment. CP&L has planned $75 million in new construction for the next three years.

World's Largest Coal Unloading Tower — Memphis

Will Serve $121 Million, 812,000 kw Thomas H. Allen Generating Station

With completion scheduled for October, erection of the world's largest unloading tower is underway in **Memphis, Tennessee.** The unusual "Siamese twin" unloader, designed and built by Dravo Corporation, will serve the huge **Thomas H. Allen Generating Station** being constructed for the City of Memphis.

Actually two towers on a single base, the unloader will have two welded triangular booms, each with a 13.3-ton capacity bucket, and two sets of operating equipment. Each boom will have a free-digging capacity of 1300 tons an hour, or an average rate of 850 tons an hour.

Coal barges arriving at the plant, located on McKellar Lake off the Mississippi River just below Memphis, can be unloaded two at a time. The exceptionally long booms, which will extend more than 100 ft beyond the dock face, will permit the bucket trolleys to rack back and forth over two 35 ft wide, 1500-ton barges moored side by side.

When the unloader is digging at top speed, more coal is dumped into the hoppers than can be discharged to the conveyor belts. Thus a surplus is built up in the hoppers, assuring a steady flow of coal onto the conveyor belts even when the unloading is interrupted for the repositioning or changing of barges.

An adjustable d-c voltage control from an a-c power supply makes possible greater horsepower output from the operating motors and smoother bucket handling and trolley motion.

In addition to the unloader, Dravo also is supplying barge shifting equipment, which positions the barges under the unloader, moving out empties and moving in loaded barges as needed.

When the new plant begins operation late this year, Memphis will be generating its own electric power for the first time. Currently, the city is served by the Tennessee Valley Authority. The new facility, to be known as the Thomas H. Allen plant, will be operated by the Light, Gas and Water Division of the City of Memphis.

The station was designed and is being constructed under the supervision of **Burns and Roe, Inc.** Steam production, feedwater, power generating and miscellaneous equipment selected for the plant were tabulated on page 41, SPI for January, 1958.

(Continued on Page 91)

How to get a "custom" pump at a standard price

Here's a new line of vertical centrifugal pumps easily tailored to your exact needs.

For process transfer or heavy-duty sump service, these pumps have features which assure long trouble free life with a minimum of maintenance.

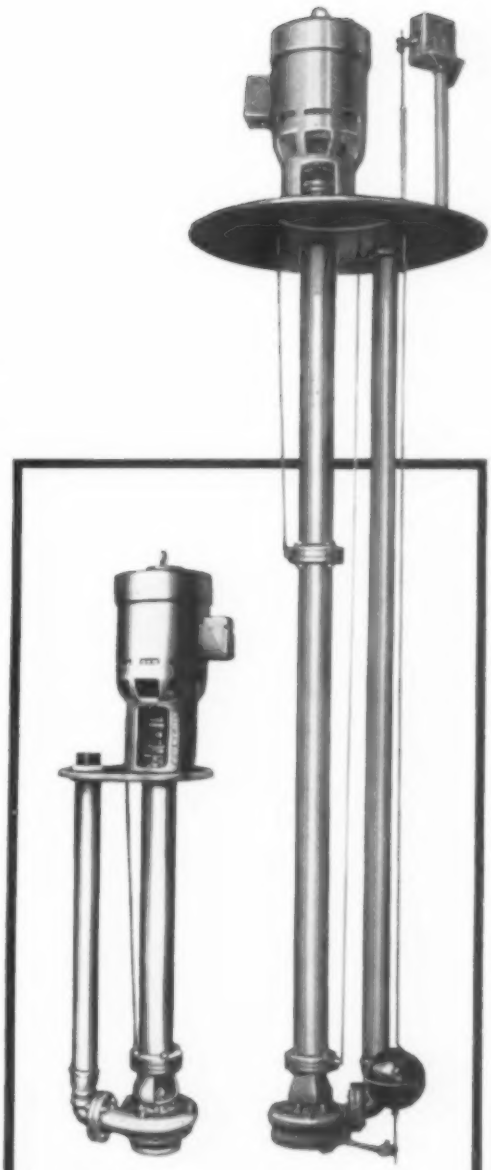
Because they're built from standard parts, delivery is fast and there is no premium charge for custom building. When you want to change pit depth or pump ratings, you merely replace necessary parts. Units may be adapted in the field. Shafts and pipe columns are available for any pump length from 2 to 20 ft. in 6-inch increments.

There are types for wet or dry pits, with capacities to 1080 GPM or heads to 290 ft. Vaporproof construction is available.

Complete details in Bulletin 726.2.

GOULDS PUMPS, Inc., Dept. SPI-9, Seneca Falls, N. Y.
Main Office and Works

Branches and Representatives in all principal cities



Goulds Fig. 3173 Goulds Fig. 3171

GOULDS

PUMPS FOR INDUSTRY

MANAGEMENT CLINIC

Conducted by ROBERT H. EMERICK, North Charleston, S. C.

How to Get Your Plant Budget Approved

Question . . . . . .

AS SUPERINTENDENT of the power department of our company, I have very poor luck in obtaining the funds I need for modernization and for more efficient operation. Every year I turn in my budget for the coming year, and top management chops it right down to a sort of subsistence level. They keep reminding me that my department is a consumer and not a producer, and that every other department of the company must dig down into its pocket to keep me going.

What worries me is that one of these days our patched-up plant is going to lose one of its patches, then the whole works will be out of production for maybe two or three days, and I'll be blamed more violently than ever for an interruption that really is not my fault.

Can you suggest any means by which I can make my top executives see that smoke from overloaded boilers, and kilowatts from an obsolete, inefficient generator, are costing them real money every day of their lives?

Suggestion . . . . . .

AS WE SEE IT, you probably are suffering from a disease common with technical men: You don't explain technical problems to non-technical people in terms they can understand. In this case, all that you have done, and all that you want to do should be converted into dollars, and so presented to top management.

We suggest that well before budget time (three or four weeks in order to allow time for the report's digestion) you submit a brief record of what you have accomplished during the past year, and what you want to do in the year coming up — *all expressed in dollars saved.* Such a report might take this form:

Accomplishments This Year

a. Installed new water treating system that is saving $—— per year.

b. Installed automatic control on the process steam circuit by which we are saving $—— per year.

c. Re-aligned several motorized operations in the production department that improved our power factor and saved us $—— for new equipment, thus made unnecessary.

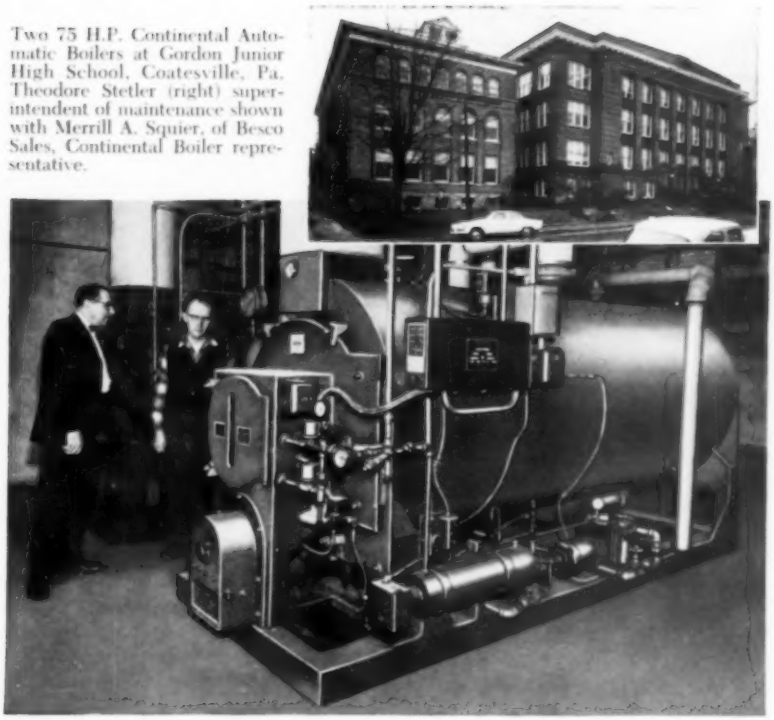
Accomplishments Planned For Next Year

Change Planned	Reason For	Improvement Cost	Estimated Savings Per Year
a	To Save $	$	$
b	To Save $	$	$
c	To eliminate Breakdown Hazard	$	$ per day if breakdown occurs and stops production.
	Totals	$	$

These totals of improvement costs and estimated savings then support your budget requests in terms that every treasurer and every comptroller fully understand. Since operating savings are of prime importance to every management worth its salt, somebody higher up is going to like what you have done and are trying to do, and will see your side.

The point to remember is that a profit-making company is concerned with profits, and not thermodynamics. Talk to these people in their language, which is dollars, and they'll give you the understanding that apparently you are not getting now.

Two 75 H.P. Continental Automatic Boilers at Gordon Junior High School, Coatesville, Pa. Theodore Stetler (right) superintendent of maintenance shown with Merrill A. Squier, of Besco Sales, Continental Boiler representative.



HEATING COSTS CUT 21% with new Continental Boilers

In 1955, the Coatesville, Pa. school district purchased two new 75 H.P. Continental Automatic Boilers firing #5 oil to heat three adjoining school buildings from a central plant. The new boilers saved $2,614.51 in the first two years of operation. This is a 21% reduction in heating costs.

Merrill A. Squier, of Besco Sales, Continental Boiler representative in the Philadelphia area, says:

"You can count on Continental for highly efficient, low cost steam or hot water. Because of the simplified design, maintenance and downtime are cut to the bone. There are no refractory baffles to burn out, leak and cause short circuit of gases. Free rapid water circulation keeps heating surfaces clean. Steam and water spaces are easily checked through openings. Clean-out is easy."

Continental Boilers, firing oil or gas, are available in models from 20 to 600 H.P. with on/off, low-high-low, or modulating controls. For steam heating or process work at pressures from 15 to 250 lbs., or hot water heating at low or high temperatures. Literature on request.

BOILER ENGINEERING & SUPPLY COMPANY, INC.
Phoenixville, Penna.

The Continental AUTOMATIC BOILER

A HALF CENTURY OF BOILER MANUFACTURING EXPERIENCE

Let your Continental Automatic Boiler Specialist Help You

CALIFORNIA
El Cerrito—American Engineering & Mfg. Corp.
Palm Springs—Pacific Engineering Equip. Co.

COLORADO
Englewood—Champion Specialty Co.

DISTRICT OF COLUMBIA
Washington—Charles C. Plummer

FLORIDA
Jacksonville—H. L. McMurry & Co.
Miami—H. L. McMurry & Co.
Orlando—H. L. McMurry & Co.
Tampa—H. L. McMurry & Co.

GEORGIA
Atlanta—Mechanical Associates
Augusta—Tarte Boiler Repair Co.

ILLINOIS
Chicago—Automatic Steam Sales Co.

INDIANA
Indianapolis—Plibrico Sales & Service Co.
New Albany—Falls Cities Boiler & Machine

LOUISIANA
New Orleans—Cressy Sales Company

MARYLAND
Baltimore—Heating Services, Inc.

MASSACHUSETTS
Dorchester—Lewis National Corp.

MICHIGAN
Dearborn—Kramer & Associates, Inc.

MINNESOTA
Minneapolis—Oil Burner Service Co., Inc.
St. Paul—Lincoln Equipment Company

MISSISSIPPI
Jackson—Climate Engineers, Inc.

MISSOURI
St. Louis—Continental Boiler & Sheet Iron Works

NEBRASKA
Omaha—Midwest Utility Service Co., Inc.

NEW YORK
Buffalo—W. J. Clark Equipment Co.
Gloversville—Olin T. Caldwell & Co.
Hudson Falls—Boiler Equipment Co.
New York—Thermal International, Inc.
Rochester—Ernest J. Rookey
Syracuse—U & S Supply Corp.

NORTH CAROLINA
Greensboro—M. G. Newell Co., Inc.

OHIO
Cincinnati—Kenneth B. Little Co.
Cleveland—P. M. Equipment Co.
Toledo—Air Conditioning Distributors, Inc.

OKLAHOMA
Oklahoma City—Mecha-Line Co.

PENNSYLVANIA
Phoenixville—Besco Sales, Merrill A. Squier
Pittsburgh—John C. Gregg Company

RHODE ISLAND
Providence—Weatherall Engineers, Inc.

TENNESSEE
Knoxville—Boiler Supply Co.
Memphis—Middle States Associates, Inc.
Nashville—Boiler Supply Company

TEXAS
Dallas—Rodgers Engineering Co., Inc.
Fort Worth—J. P. Philibert

UTAH
Salt Lake City—Power Engineering Company

VIRGINIA
Suffolk—C. Fred Bailey

WISCONSIN
Milwaukee—Industrial Steam, Inc.

INDUSTRY SPEAKS

Performance of 1,000 Handicapped Workers

Du Pont Company Reports

AN OVERWHELMING majority of the more than 1,000 physically handicapped employees of the Du Pont Company have achieved average-or-better levels of job performance, safety, and attendance, according to a company-wide study just completed by the Employee Relations Department.

Moreover, it appears that performance is not directly related to severity of the handicap, as some of the best performers have the most severe handicaps — amputation, blindness, deafness, and paraplegia.

Of Du Pont's 90,000 employees at the close of last year, 1,021 in plants, laboratories, and offices throughout the country were physically handicapped in terms of the severe standard: ". . . a physically handicapped condition which might prevent an employee from handling such jobs as the average non - impaired worker could handle." So rigidly does the company adhere to this definition that many employees who normally would be considered handicapped are not included in the study.

The safety records of this group, as reported by their supervisors, disclose that 39% were better than average; 59% average, and only 2% were below average. In attendance, 36% were better than average, half were average, and 14% were below average. In job performance, 27% were above average, 60% average and only 13% below the norm.

Operators comprised the largest segment of the handicapped people with 258; following closely were craftsmen and foremen, with 255. Professional and technical jobs totaled 163; service workers, 145; clerical, 131; supervisory and management, 43; and laborers, 26.

Nine totally blind employees and 12 deaf mutes were included in the group. Amputees numbered 118; cardiovascular diseases accounted for 259 (the largest group); musculoskeletal diseases such as severe arthritis and scoliosis, 193; the neurological group (polio, paraplegia, cerebral palsy, etc.), 131. Severe hearing and vision impairments, short of total affiiction, and miscellaneous handicaps accounted for the remainder.

The statistics disclose that workers who were handicapped at the time they were hired perform better on the job and have better attendance and safety records than those whose handicaps developed after going to work for the company. Their better showing probably can be explained by the fact that those who are handicapped at the time of employment usually have an exceptionally strong incentive to prove their ability on the job.

Job Possibilities

Although Du Pont has long had an interest in the employment of handicapped persons, it was not until October, 1954, that a formal company attitude was crystallized, in line with efforts of the President's Committee on Employment of the Physically Handicapped and its counterparts, the Governor's Committee in each of the 48 states.

In Delaware and other states the company works closely with the Governors' Committees and the United States Employment Service in the hiring of handicapped people, as do other companies. Those organizations keep track of job possibilities and send applicants to see potential employers. This gets the information centralized for the handicapped so that they do not need to hunt nonexistent jobs. Some applicants apply directly to the company but the centralized setup is considered better for the individuals, and most of them use it.

Du Pont does not create jobs specially suited to handicapped people but men and women referred to the company by the Governors' Committees are interviewed just as are other job applicants. The interviewer looks for the same qualities in the handicapped as he does in other people. With the qualities determined, it is a question of matching the individual's abilities with any jobs that may be open.

Once the new employee is placed, supervision plays an important role — as it does with any other employee — but with the handicapped, the role of the supervisor is doubly important.

"With the traditional concern of Du Pont Company management for the individual," says Emile F. du Pont, director of the Employee Relations Department, 'we feel that our supervisory personnel throughout the company are so helpful with on-the-job rehabilitation that our success may well be above the average in industry throughout the country.

"SPANGRID *Steel Pipe...pre-cut to our specifications...*
SAVED US 133 MAN-HOURS!"

Says Robert B. Anderson, President of R. B. Anderson, Inc., mechanical contractor for Karan Corporation Building, Denver, Colorado

"SPANG helped us where it counts . . . in savings of time and money," states Mr. Anderson. "The problems my company faced on the Karan radiant heating job are universal: to meet the job specifications and deadline and yet keep costs down. Thanks to SPANG we did just that. SPANG gave us swift delivery of the entire order—10¼ miles of SPANGRID Steel Pipe, pre-cut to non-standard lengths.

Spang Supplied Special Pipe Lengths

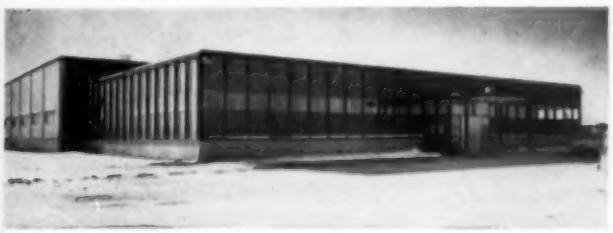
"What impressed me," says Mr. Anderson, "was SPANG's ability to deliver their one-inch in lengths of 38 feet. If we had been able to get only the standard length—21 feet—we would have had to make 800 extra welds. This saved us approximately 133 man-hours, or $465.00.

Fast Service From Spang

"SPANG delivered our entire order of CW Pipe two weeks ahead of earliest date offered by their competitors. This enabled us to fabricate the entire radiant heating system by the time the general contractors were ready to pour the concrete floor slabs."

You Can Get Top-Quality Service, Too!

Your local SPANG Distributor can give you this same fine service on your SPANG CW Pipe order. SPANG Pipe is manufactured under strict quality-control methods, tested and inspected to assure you of a top-quality product every time. Make it steel pipe—make it SPANG.



Architect: Stark and Kondel, Denver
General Contractor: J. & K. Construction Company, Denver
Mechanical Contractor: R. B. Anderson, Inc., Denver
SPANG Distributor: Great Western Pipe and Supply, Denver

SPANG-CHALFANT
DIVISION OF THE NATIONAL SUPPLY COMPANY
General Sales Offices:
Two Gateway Center, Pittsburgh, Pa.

SPANG®
CW STEEL PIPE

Welder is shown assembling the radiant grid coils, which will be imbedded three inches below the surface of a 6 to 8-inch thick concrete slab floor. More than 10¼ miles of SpanGrid Steel Pipe were installed.

William K. Manion, Senior Analyst, applies supersonic Reflectoscope to an axle over the L&N wheel-truing pit (left). If oscilloscope image indicates an internal flaw in the axle, he places camera hood on Reflectoscope (right) to record the image on Kodak Super-XX Film.

The Picture of Health for Diesels

Here's How L & N Cuts Maintenance Extensive Photographic Program Pays

PHOTOGRAPHS, in one of its working guises, lets the Louisville & Nashville Railroad take a positive look into the future — to make preventive maintenance really preventive.

L&N maintenance managers take a long hard look into the future of its more than 700 diesels regularly and manage to cut costs before they come into being. They have found that a photographic diagnosis of engine ailments before they become ailments is the best way to keep maintenance costs lower — and to give modern meaning to the nickname of "Old Reliable."

In the shape of a Grating Spectrograph, the camera which the L&N uses to peer into the future of its diesels would scarcely be recognized by the average Sunday snapshooter. Nor do the Spectrograms bear any resemblance to the usual album prints of mother, junior, and dad. The major difference between their photographs and family album pictures is that these photographs are for the future rather than to recall an event or a person.

The L&N's photographic objectives are to:

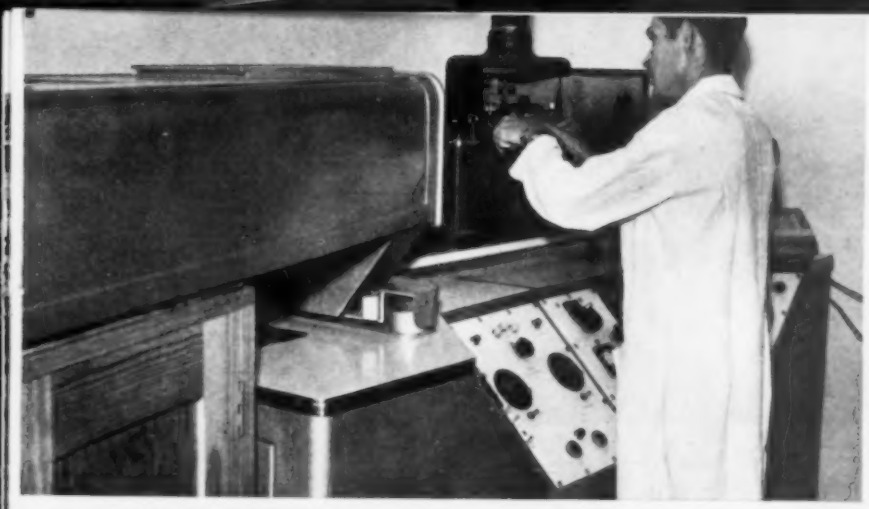
1. Help set up guideposts for proper maintenance of new equipment.

2. Provide evidence for convenient review in case of accident or defect.

3. Help ultimately to eliminate potential trouble spots from future purchased materials.

Headquarters for the roads photographic investigations is the Testing Laboratory at the South Louisville, Kentucky shops of the railroad. Engineer in charge of tests is J. W. Hebden, who has demonstrated that photography can be of great value in safeguarding a railroad's expensive and widely spread-out facilities, as well as in protecting the safety of its passengers and freight.

William K. Manion, senior an-



Upper left — Mr. Manion places an electrode containing mineral sediment from lube oil in the Spectrograph arc stand.

Lower left — Manion reads the photographic plate from above exposure, noting relative width of the spectrum lines.

Upper right — Making an exposure on Kodak Spectrum Analysis No. 1 Plates in a 3-meter Grading Spectrograph.

Lower right — Using a Desitometer Calculating Board, he obtains exact readings of contents to be filed detailing performance history.

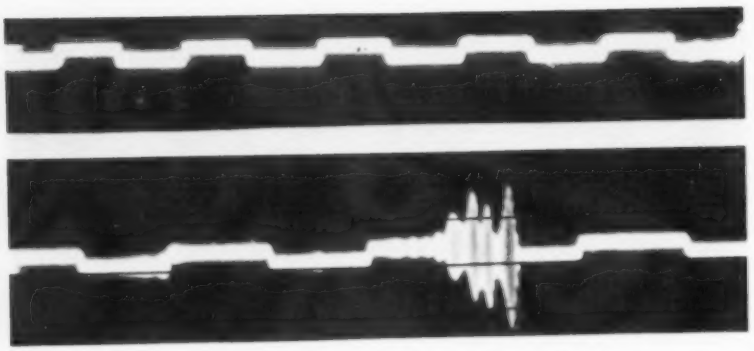
alyst at the Testing Laboratory, reemphasizes this when he says "People always are saying one picture is worth a thousand words. We've proved it."

Indeed, Manion and his coworkers prove the validity of this age-old maxim time and time again whenever they go to the compact Crankcase Lubricant File maintained on each of the L&N's more than 700 diesel engines. These records provide an operating history for all the L&N's switchers, coal haulers, or passenger diesels.

Lube Oil Checks

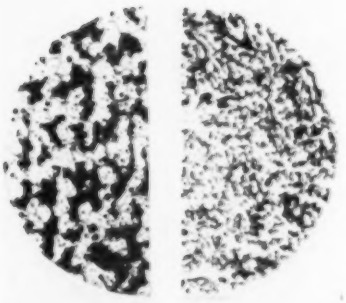
The crankcase history of each diesel is determined chiefly by frequent Spectrographic Analyses. The railroad has found that even locomotives of similar manufacture and model have their own "personalities," reflected in the varying elements found in the lubricant. Deviations from an engine's normal behavior are detected by sudden changes in those levels. Such changes are revealed in photographs of the light spectrum created by elements found in the crankcase.

When a new engine is added to the L&N diesel fleet, a series of "specs" — spectrographic analyses — is made over the engine's first 90 days of service to determine what its crankcase peculiarities will be. From that point on, anal-



Upper view — Reflectoscope photograph of a wavelength image taken in a normal axle.

Lower view — Similar photograph in which an internal axle flaw is indicated.



Metallascope photograph indicating a piece of metal used by L&N, before heat treatment (left), ,and after treatment (right).

yses are made every 15 days or every time the engine is in a shop.

The samples for these spectrographic lubricant breakdowns are taken in shops and roundhouses at Nashville, New Orleans, Birmingham, St. Louis, and throughout the Old Reliable system. They are rushed back to the South Louisville lab in special shipping cases. And then, after a viscosity test for fuel dilution or a "fry test" for water dilution gives a rough indication of any contamination or dilution of the oil, photography takes over.

Technicians such as Chief Analyst Manion analyze the samples on a seven-day-a-week schedule. For a typical "spec," the analyst places five grams of an oil sample in a cruciable, adds an internal standard such as nickel to provide a spectrum reference line, includes a buffer to give the solution body and then burns the resulting substance to an ash in a small furnace. As a result, only the mineral matter which was contained in the lubricant remains. With graphite, this sediment is packed into an electrode and burned for 30 seconds in the arc stand of a 3-meter Grading Spectrograph.

"All we have to do at that point is photograph the electrode while it is burning," Manion explained. "We get a picture of the spectrum through a fixed shutter. The Eastman Kodak Spectrum Analysis No. 1 plates that we use are sensitive enough to record the spectrum, but they don't burn out the background. Consequently no correction is needed. We merely have to study the developed plate to find out how much of each metallic element was present in the lube sample."

An evaluation is made of each sample on a Densitometer Calculating Board which reveals the minute quantities that have been recorded. The amounts are entered on the diesel's record card, for each entry may carry a significance demanding swift action.

Excessive iron in a lube sample, for instance, may indicate piston ring wear and together with a high silicon reading, it could be the tip-off to a malfunctioning air filter. The presence of excessive chromium would warn that there is a water system leak into the crankcase, since sodium chromate pellets normally are used to inhibit corrosion in the cooling system. A high aluminum reading on certain types of engines would give advance warning of excessive piston wear. A jump in the silver content in other types would point to the fact that corrosion is wearing away wrist-pin bearings.

These findings, when compared with previous readings, are of more than academic interest. Says Manion, "We've had cases in which the lead content readings went from, let's say, nine to 59 parts per million over a 30-day period. On the basis of that evidence bearing inspection would be ordered.

On occasion the "spec" findings are critical enough to warrant an emergency call that can prevent serious damage to a locomotive. "If we find an unusual increase in chromium or aluminum content," Manion said by way of example, "we may put in a telephone call immediately to the point at which the engine is located and tell them to shut down the engine, correct water leaks, make blow-up tests and inspect for possible bearing damage."

There may be several such calls during the course of a week. The Testing Lab regards the fact that there are not more calls as a tribute to spectrographic photography which enables the lab crew to spot potential trouble in advance and prescribe preventive maintenance.

Mysteries Solved

In addition to performing lubricant analyses, the "specs" help solve "mysteries." Such a case of the shipment of cast-iron which arrived broken (and turned out to be pot-metal upon analysis). The dilemma of what substance stained a granite slab being shipped by boxcar was solved. The question of what to do with a shipment of contaminated grain (which proved unfit for distilling, but suitable for animal feed) was answered. And the remedy for a passenger's "ruined" suit was prescribed when it was shown to have suffered only sugar stains.

The rise of spectrography and photography at the L&N Testing Lab has paralleled the growth of

the diesel in the Dixie Line's scheme of things. In 1950, dieselization of the L&N was in full swing with the purchase of 37 for freight service. By the end of 1956, dieselization was complete. There were problems all up and down the road as the result of this progress. The Testing Laboratory was not absent when the problem-solving assignments were handed out. Here photography in its more usual and more easily recognized phase came into its own.

J. W. Hester of the laboratory staff pointed out, "One of the things that we had to do in the Testing Lab was to measure damaged parts that were sent in and then make a drawing to illustrate where the break or defect was located. At the end of the year, we made blueprints from the drawings so that we could compile a file on failures for each part, to be used in evaluation of what changes should be made.

"As diesels became more prominent, the drawings got more complicated and more numerous. The new locomotives have so many different parts, the art work was getting out of hand."

When the camera replaced the pen, however, the situation changed. Each defective part that comes in now is photographed, usually with the 4-by-5 view camera Hester uses. "If the part is a burnt-off journal, we have a photographic record of the damage. Formerly, we could draw in a crack or a jagged edge on a diagram. But we couldn't be sure of its accuracy. With a photo, we can't go wrong on details, no matter how tiny," he said. "We also have been photographing pad type journal lubricators which may have required further study. This is something that simply would have been impossible to draw."

Any defective part is photographed, no matter how big or small it is. On a call from some corner of the South Louisville shops Hester may pick up one of his two 4-by-5 press cameras and rush out to record the details of a bashed-in passenger car or a cracked crankshaft still mounted in the engine.

J. W. Hester of Testing Laboratory staff photographs a burnt-out journal part. He uses Kodak View Camera and Royal Pan Film.

The photos that result give the L&N a lot more flexibility in action taken to repair or prevent damage. Having sent a photographer afield to get a picture of minute cracks in the chrome plating of an engine's crankshaft, the Testing Laboratory then is able to send a print of the picture to the supplier of the defective part. This not only is evidence of the damage, but also may help the supplier in research which will prevent such defects in the future.

The Testing Lab's photo files have been a boon to L&N executives, too. When they are handling a claim or another matter involving a part that has been photographed, they no longer must write long descriptive letters. A telephone call will bring a print of the item to their desks for inclusion with the correspondence.

For all its photography other than specialized types demanding specialized film, the Testing Laboratory photographers have been using Kodak Royal Pan Film ever since it was introduced. "Its speed gives us the depth of field we need when we are working in dark nooks and crannies," Hester said. "And we get good results in the close-ups in which detail is essential."

One of the jobs requiring other film is the diesel axle-testing program. Each axle in the L&N inventory is checked at least once a year as it comes through the South Louisville yard's wheel-truing machine. The Reflectoscope, a supersonic device, reveals any internal cracks with fluctuating wavelengths shown on an oscilloscope. When a defect is noted, a camera hood is placed over the Reflectoscope screen in the wheel-truing pit and a photograph is made of the wavelengths on Kodak Super-XX Film.

The Testing Laboratory prepared a set of sample wavelength prints illustrating axle failure situations. With this as a guide, the workmen recognize defective axles and are able to photograph them internally on the spot so that the condition can be analyzed and decisions made on further usage.

In getting programs such as these under way, the Testing Laboratory minimized the possibility of false starts by calling on Kodak's technical representatives for advice. "They steered us right on the films and plates we needed for special equipment and have been available to help whenever we needed them," Manion said.

Plant Services

THE NEW modern Martin-Orlando manufacturing facility in Orlando, Florida consists of four main structures — the first being referred to as the *Main Building*, a structure 640′ wide by 500′ deep, totally air conditioned, and housing both manufacturing and office type operations.

The manufacturing portion was framed in structural steel, with columns on 40′ x 50′ centers, the roof being supported on long span trusses 8′ on center. The side walls of the manufacturing area are insulated with 1¼" fiberglass board, with an inside finish that has a high quality light reflection and sound absorption. The outside wall was constructed of Galbestos V Beam siding that can be relocated easily whenever there is a requirement for expanding the manufacturing area.

The roof of the manufacturing area was constructed of poured-in-place gypsum over 1¼" fiber-

THE MARTIN Company of Baltimore, Md., decided late in 1956, to create a new facility specifically designed to produce the new types of missiles, electronic components and small weapons systems. It had to be built as quickly as possible, using 100% company funds, and incorporate flexibility and expandability that is so necessary in this very competitive industry.

It was felt that the highly technical and scientific personnel required for this operation would be eager to join an aggressive organization housed in attractive facilities and located in the comfortable natural surroundings of Central Florida.

When Martin purchased 6,777 acres southwest of Orlando in 1956, the city at that time had a population of approximately 75,000 people. It was anticipated that within 18 months the new plant would have 3,000 working employees. These employees, with their families and the necessary supporting organizations, would increase the community by approximately 12,000 residents in one year. Sound steps were taken by the company in order to assure the locality, that this new growth would not come in such large blocks as to upset the economy, housing, utilities, telephones, and traffic in the area.

In order to prevent any disturbance to the city, the company leased 7 interim buildings, into which they moved approximately 2,300 employees during a period of 12 months, while the permanent buildings were under construction. Because of this planning, the community was able to absorb the increased population.

The good of the community remained as a constant consideration in all moves that were planned by the company. This philosophy resulted in the company providing 20 acres of land for a future elementary school, and 30 acres of land for a future high school on the eastern edge of the property. Also, five acres of land were granted to the Orlando Utilities Commission for the construction of a water treatment plant and 30 acres of land were granted to Orange County for the construction of a one-million-gallon-per-day sewerage treatment plant. These two utility plants service the new Martin plant, and will also accommodate the residential and commercial areas that are ex-

- $18.5 million facility on 6,700 acre site in Orlando, Florida . . . largest structure in Florida that is completely air conditioned . . . 500,000 sq ft of floor space in 5 buildings . . . seven parking lots which accommodate 2,500 cars . . . 5 miles of company roads
- Power Requirements — 12,000 kva (4,000 kva for air conditioning, 6,000 kva for plant power and 2,000 kva for lighting) . . . anticipated increase to 20,000 kva in next three years
- Air Conditioning — 3,300 tons (3,000 tons from five 600 ton units on manufacturing floor plus 300 tons from smaller individual units)
- Lighting — factory lighted with 800 MA high output 277 volt fluorescent fixtures; offices with 277 volt fluorescent 2 lamp troffers designed for 80 foot-candles low brightness
- Water — plant requirements in excess of 400,000 gallons per day . . . 163 ft. 500,000 gallon overhead water tank
- $350,000 waste treatment facility
- Economical construction, low maintenance costs and a completed facility in less than a year were design criteria

Martin-Orlando

By A. R. BERGSTROM
Dir. of Plant Facilities
The Martin Company
Orlando, Florida

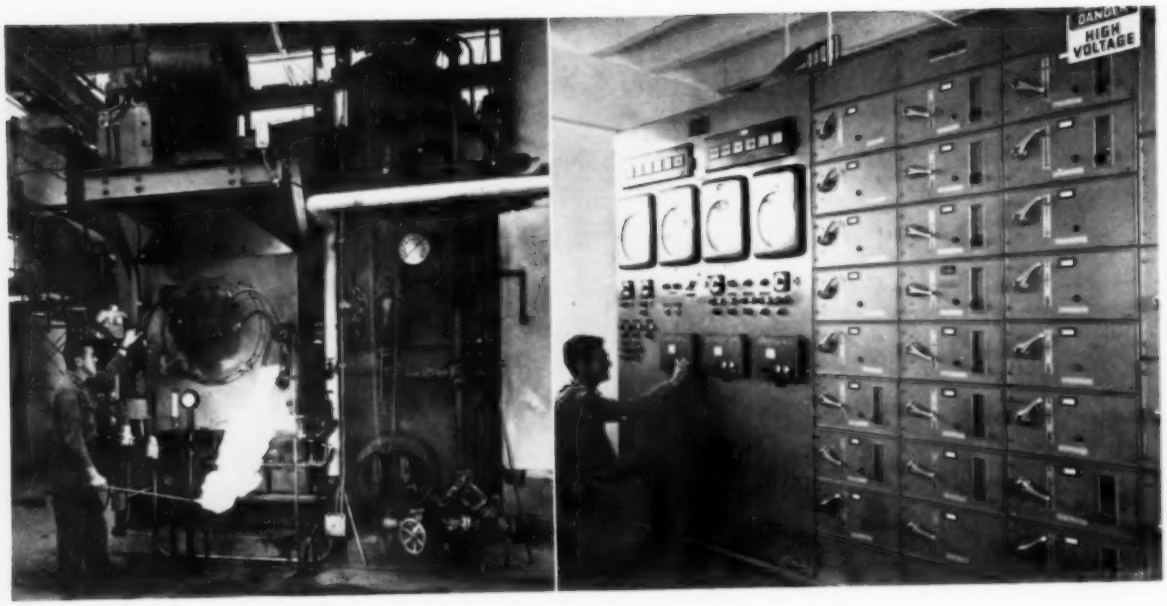
Mr. Bergstrom, a graduate of Georgia Tech (general engineering) and Emory University (business administration) has been with The Martin Company since July, 1956. He was previously connected with The H. K. Ferguson Co. in Cleveland and The Arundel Corporation in Baltimore.

pected to be constructed north of the new plant site.

Design contract was awarded to the architectural and engineering firm of Connell, Pierce, Garland & Friedman of Miami, Florida. A design criteria stated that the plant upon completion should incorporate the attractiveness of outdoor living throughout the work areas wherever possible, and that the natural beauty and brightness of this subtropical location should be enhanced by the architectural attractiveness of the building. The schedule for design and construction was as tight as practical. The architects were commissioned to start work on November 6, 1956, with a schedule that called for the building to be partially complete, so the installation of manufacturing machinery could start on October 1, 1957. Office areas were to be complete by December 1, 1957, and the entire facility of approximately 500,000 sq ft would be complete on January 1, 1958. This schedule was met.

glass form boards and finished with a 20 year bonded built up tar and gravel roof. The insulation panels in the ceiling also had the same treatment for sound absorption and light reflection. The concept of light reflection was carried into the floor construction, where the concrete was finished with white cement in order to minimize the difficulty of working beneath large objects without sufficient light.

The front portion of this building, which contains the offices and the engineering functions, is a reinforced concrete structure with columns on centers of 20' x 25'. The first floor slab was poured on grade, the second floor and roof were of pan formed reinforced type concrete construction, with the exception of one high bay area in the northeast corner of the office building that is used for engineering tests. The roof over this laboratory was formed by using



ABOVE — Two Keeler boilers (one standby) are in the General Service Building. Control panel of the Graver industrial waste treatment panel (right) safeguards against the possibility of discharging harmful industrial waste.

NEXT PAGE — Note excellent plant lighting with 800 MA high output 277 volt fluorescent fixtures. Spot welders in the sheet metal area are set on concrete floors topped with white cement which gives excellent reflection from ceiling lights.

To conserve floor space, unit substations are mounted above the lavoratories in the factory area. Plug-in bus duct is used for distribution of 480 volts 3-phase and 120/208 volts 3-phase, 4-wire power throughout the factory area.

precast concrete beams and roof slabs.

The exterior of the office building was formed by using heavy precast concrete panels hung on the reinforced concrete frame. These panels were given a very attractive exterior finish by the use of a Chattahoochee River gravel facing. The precast panels on the exterior of the offices also allow for maximum future expandability.

When the design criteria for this new plant was being compiled, it was the desire of management to make this facility an air conditioned technical center, that would contribute to the quality of the highly intricate electronic and small weapons devices, and also offer working comfort to the technicians throughout the building.

In order to best fulfill this philosophy, it was decided to create a second structure that would house the boilers, air compressors, plating tanks, and other heat generating equipment, and separate them from the structure of the manufacturing and assembly areas in the main building.

The second structure is referred to as the *General Service Building*. It has 43,000 sq ft with reinforced concrete columns on 30' x 35' centers, with a poured-in-place reinforced concrete slab roof deck. The roof is a built up tar and gravel construction. Interior and exterior walls are all non-load bearing concrete block, and are readily removable for expandability and flexibility. This building has clear headroom of 19' beneath the concrete roof slab, with the exception of two small areas totaling 2,625 sq ft on the second deck where office areas were constructed. This building has special louvers in the exterior panel walls, to provide the vast amount of outside ventilation required for the plating room, the heat treating area, the painting area, and the boiler room.

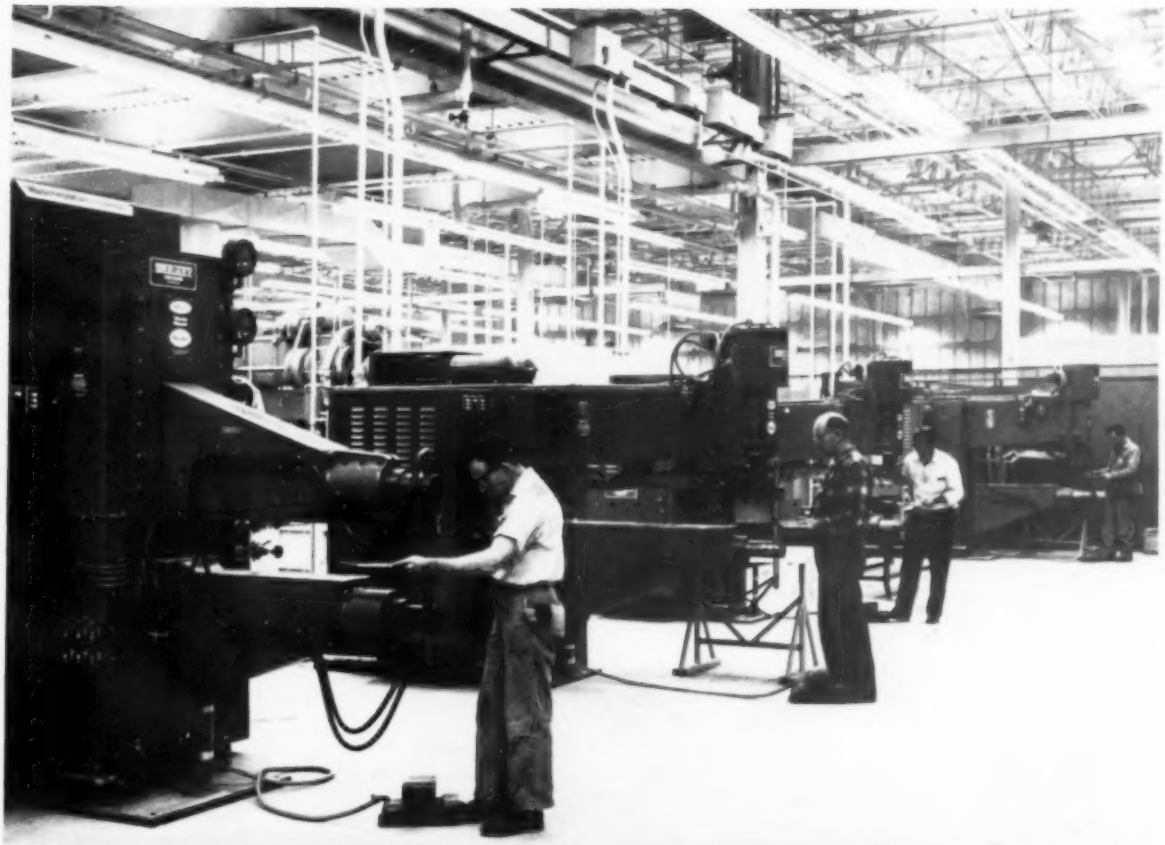
The third building is the *Industrial Waste Treatment Building*. It is located directly behind the General Service Building to minimize the amount of expensive drain lines feeding from the plating tanks.

The fourth building is the *Conservation Building*, a reinforced concrete structure with concrete curtain block walls and precast reinforced twin T roof beams. The roof is of built-up tar and gravel.

Power Distribution

In view of the expandability and flexibility that was built into the overall facility, the original estimate for power consumption was based on the fact that within three years it was anticipated the total floor area would be doubled, becoming approximately 1,000,000 sq ft.

On this basis, the Orlando Utilities Commission was informed that the new plant needs would be approximately 12,000 kva immediately, with an increase in power consumption to 20,000 kva in the



Plant Services at Martin-Orlando (Cont'd)

next three year period. The Orlando Utilities Commission installed a 3-phase oil immersed 115 kv to 12.47 kv power transformer approximately ¼ mile east of the Main Plant Building at the south end of the commission's 115 kv overhead line. Of the initial 12,000 kva requirement 4,000 kva was to be used for air conditioning, with 6,000 kva for plant power, and 2,000 kva for lighting.

The power is distributed inside the main plant through five double ended substations each with 1000/1333 AA/FA kva air cooled transformer, two primary switching cubicles on each end and secondary feeder section with air circuit breakers and a main secondary circuit breaker. All large loads, 100 kva or greater, are fed directly from the substation — smaller loads are fed from plug-in bus ducts. Each in turn are fed from substations as radial feeders. The plant primary distribution is at 12.47 kv in lead covered and armored cable.

The main plant areas are supplied by three underground feeders to a switching station within the initial plant area. This switching station employs load break sectionalizing oil switches with oil fuse cutouts. A double loop radial primary type distribution is used to feed the five substations throughout the main plant building. Interconnection between sections of each loop is provided through tie breakers located in each substation.

The Conservation Building and General Service Building are also supplied with primary selective radial feeders from the switching station through overhead and underground feeders respectively.

The unit substations are mounted above the men's and women's lavoratories in the factory area in order to conserve floor space. The plug-in bus duct is used for distribution of 480 volts 3-phase and 120/208 volts 3-phase, 4-wire power throughout the manufacturing area. Four (4) conductor bus duct was employed with the 4th conductor being utilized for an equipment ground on 480V circuits. Distribution of the 208/120V is provided only in certain areas, as the requirements arise.

Branch circuits for power and lighting are run with TW, RH or RH-RW wire in conduit in wire troughs. Multiple circuit, 3-phase, 4-wire are used whenever practical. Direct lines are run from the load center substations to the large horsepower motors such as the 600 hp units that operate the 5 Centravac air conditioning compressor units. These heavy motors are installed immediately adjacent to the substation, in order to minimize the length of cable run.

Other Plant Services

Lighting — The factory area is lighted with 800 MA high output 277 volt fluorescent fixtures, and the office areas use the 277 volt fluorescent 2-lamp troffers designed for 80 foot-candles low brightness.

A complete electrical grounding system was installed with connection points throughout the plant to provide a low resistance connection for electronic equipment and testing work involving radio frequencies. The grounding system will also afford the maximum in protection against electrical shock to personnel and lighting damages.

Air Conditioning — The air conditioning is supplied by five 600 ton Trane Centravac units located on the manufacturing floor immediately adjacent to the servicing substations. This 3,000 tons, plus an additional 300 tons supplied by multiple smaller individual units, answers the total requirement for 3,300 tons inside the main building. Low pressure steam heating coils are installed at the air handling units in the ducts that supply the conditioned air to areas around the perimeter of the manufacturing area and along the front of the office building.

Water — The water requirement of approximately 400,000 gallons per day is supplied to the plant by a 16" main from the Orlando Utilities Commission water station located approximately one mile east of the main building. The water is pumped into a 500,000 gallon overhead water tank 125' high from the base to the bottom of the tank.

Inside the tank is a standpipe that reserves 100,000 gallons of water for the fire protection system. The plant is protected by a 10" fire main that loops the building, and the factory area is totally covered by a sprinkler system. Additional fire protection is given to the plant by a 300,000 gallon reservoir located at ground level with an emergency 1,500 gpm fire pump.

Water supply to the plating and cleaning areas is treated through a demineralizer system prior to use. Cooling water towers are mounted on the roof and supported by the common reinforced concrete columns along with the electric substations on top of the lavoratories. This has eliminated heavy roof construction in order to support water towers above the roof level.

Waste Treatment — The Industrial Waste Treatment Plant is a Graver Water Conditioning Company installation, and provides for pH control of rinse water effluent by the treating of effluents from either the acid or alkali sump tanks, as required. Captive sump tanks provide for holding cyanide rinse waters until they can be transferred into the special cyanide treatment tanks for complete cyanide destruction.

Two 7,500 gallon spent solution tanks have been provided to hold the used plating solutions until they have been properly neutralized and precipitated. The sludge from these tanks is then pumped into a common sludge tank and the treated solution passes through a clarifier prior to being discharged into the sewerage system, along with the rinse water effluent.

The control panel for the Waste Treatment Plant has both the visual and audio alarm systems, in addition to recording pH meters that keep the operator aware of conditions at all times inside of the various storage tanks and sewerage manholes.

At Duncan, Oklahoma . . .

Inter-Plant Deliveries Slashed by Two-Thirds

COORDINATION between fork-lift trucks and straddle carrier — palletized pump casting is placed on pump bolster by lift truck in foreground, as straddle carrier stands by to transport load to other plant. Note radio equipment which dispatches all material handling trucks in their schedule.

A STRADDLE carrier employed by the Halliburton Oil Well Cementing Co. in Oklahoma has been doing the work formerly assigned to five, two-ton flat bed trucks, five men, and five radios.

The materials handling problem became very critical when the Duncan operation developed into a multi-plant set-up. There was a constant distribution of shop order material between No. 1 and No. 2 plants, which are about one mile apart.

Prior to the establishment of the materials handling department, each plant department was responsible for its own material distribution to and from loading areas. As work was completed on a particular assembly, a fork lift truck would be dispatched by radio to pick up the item and move it to the loading area.

The former two-ton flat bed truck would arrive at the load center and would have to call a dispatcher to request a lift truck to load him. If they were all in use he was of course forced to wait until one was available.

Once loaded, he made the one mile run to the other plant where the procedure was reversed.

There were many instances where the flat bed truck and drivers were idle during these times. The problem was to find a method for moving the material with increased efficiency and to eliminate this wasted down time.

A time survey of the old system indicated that it took each truck 45 min. for a one way trip. Average load was four pallets. Everything coming into or leaving the plant is palletized on standard 42" x 52" pallets and carry loads from 1 lb to 1000 lb.

New Equipment Selected — After a careful study Halliburton decided that a Series 81 Clark-Ross Straddle Carrier would do the job. Initial cost was justified on the basis of three trips per hour, which is one trip every 20 min., compared to 45 min. average for the flat bed truck method.

Many months of operation indicate this estimate was on the conservative side. The average time between plants is 6 min. with a round trip running approximately 15 min.

Halliburton paid out the initial cost of these straddle carrier investments in labor savings alone in about six months, reduced a capital investment in trucks by $22,000, cut inner plant material deliveries by two-thirds, and have done away with a continuous backlog in the loading centers. The company has now turned all five of the flat bed trucks in for other plant usage and deployed four men into more useful activities. And the result is that they now have one straddle carrier plus one man and one radio doing the work of five trucks, five men, and five radios.

Adapted from comments by MORRIS DULANEY, Materials Handling Superintendent, Halliburton Oil Well Cementing Co., Duncan, Oklahoma.

Georgia Transformer Plant Shows How Teamwork Pays

SUGGESTION PLAN

By GEORGE D. AUSTIN, Manager
Employee & Plant-Community Relations
Medium Transformer Department
General Electric Company, Rome, Georgia

"THINK — SUGGEST. THERE IS ALWAYS A BETTER WAY!" This theme puts ideas to work and has reaped benefits for the management and employees of General Electric's Medium Transformer Department in Rome, Georgia.

Although our Rome Plant has been in operation a little more than four years, some 1,000 eligible employees have shared in awards amounting to more than $12,000. And all of this due to a well-established, smoothly-operating Suggestion Plan.

The Suggestion Plan is nothing new to the General Electric Company. Suggestion Awards were made to Company employees as early as 1906. By 1922 a formal Suggestion Plan was in operation. G-E has found from these years of experience with the Plan that suggestions are a key to improved costs, products, working conditions, and employee morale. The suggestion becomes an ideal means of upward communication — yes, even when management receives an occasional suggestion of the "drop dead" type! Employees not only gain by material rewards, but recognition and pride of accomplishment can be important morale factors.

Our Medium Transformer Department in Rome has set up a Suggestion Plan that is patterned after other Plans within the General Electric Company. Certain practical allowances and refinements are made in different plant locations according to the size of the plant, its age, its products, and similar factors. For instance, a plant with a product in development stages might have twice as many suggestions to process as a plant with an established product. But the basic philosophy and "ground rules" of the Suggestion Plan are the same throughout the Company.

Responsibility

The Manager of each General Electric Department has the responsibility for the administration of the Suggestion Plan. Generally an Administrator or Suggestion Board is appointed to see to the details of administration of the Plan.

All employees of the Company are eligible to submit suggestions except management, professional, methods and planning personnel. Suggestions are submitted on a printed Suggestion Form which provides space for the suggestion and the employee's signature. A complete set of rules is printed on the back of the form. The employee agrees to abide by these rules when he signs the form.

Submission of suggestions is facilitated by conveniently placed suggestion boxes throughout the plant and offices. These boxes not only receive suggestions but also act as "Suggestion Centers." The box holds Suggestion Forms and envelopes addressed to the Suggestion Board. It has space for a poster encouraging suggestions, and often will carry an up-to-date list of suggestion awards. Our plant has 10 of these "Suggestion Centers."

Suggestions are collected from the boxes periodically — at least once a week in our Rome Plant — and forwarded to the Suggestion Plan Administrator or Board.

Suggestions are processed as rapidly as possible. Each suggestion is acknowledged within a week of its receipt. If the processing is not complete and a decision not rendered within four weeks, the employee is advised periodically that the suggestion is still being reviewed. Processing a suggestion simply means investigating the merit of the suggestion

AT WORK

The "Suggestion Center" provides suggestion forms, envelopes, promotion poster, and box for depositing suggestions.

and keeping the suggester informed as to its progress.

Awards

Under the rules of the Plan, the Company cannot grant an award for a suggestion in excess of $25,000. The minimum award for an adopted suggestion is $5. Awards are made for adopted suggestions which are beyond the scope of the suggester's assigned duties. They must represent a new idea or new application of an old idea, or a new method. Suggestions relating to maintenance or repairs are not eligible unless they propose a definite and improved method.

The award is the significant element of the Suggestion Plan. It is direct evidence that the Plan operates — and thus is worth far more than abstract promotional material. It is to our advantage, then, to utilize every award fully for its promotional and employee relations aspects. The successful suggester is presented his award by his immediate supervisor in the presence of other management personnel. (High awards and unusual accomplishment may warrant the presence of top management.) Photographs are taken of the award ceremony. Thus the suggester is personally recognized by management for his contribution, and by his fellow employees through a picture and article in the *Plant News*.

Two Categories

To facilitate determination of awards, suggestions are divided into two categories: 1) those where savings are tangible, and 2) those where savings are intangible.

In cases of tangible savings, awards are based on the first year's savings or the duration of the job to which savings apply — if less than a year. An award is not granted until the suggestion is actually adopted and installation is initiated. Savings are computed on a net basis — after costs and expenses pertaining to the adoption of the suggestion are deducted. Actual suggestion awards average approximately 15% of net savings — but may vary from 5% to 25%, depending on the value of the suggestion.

To the uninitiated, these percentages may appear meager — particularly if the benefits of the suggestion are spread over several years. This is not always true, however, since changes in the product itself or in the operation to which the suggestion applies, may result in shortening the expected "lifetime" of the suggestion. The costs of operating the Plan should also be considered.

In determining specific awards, the Suggestion Board evaluates each adopted suggestion on a consistent basis by judging these factors: ingenuity, initiative, originality, safety, time allowance reduction — (the effect of the suggestion on the employee's own time allowance), permanency of benefits, and improvement of product.

A series of weighted point values is provided to evaluate the suggestion's overall worth and to determine the resulting award.

The factors for judging the worth of suggestions resulting in intangible savings are necessarily broader and require a greater degree of judgment on the part of the Suggestion Board. Awards may range from the minimum for suggestions eliminating minor hazards to sizeable amounts for suggestions of unusual originality, wide application and with potential dollar savings in such areas as Workman's Compensation.

When a suggestion is not adopt-

A suggestion award of $400.00 is presented to Frank Drummond by his supervisor, H. G. Edmondson. Mr. Austin, Manager — Employee & Plant-Community Relations (left), and Mr. Lawton — General Manager look on.

ed, it is important that the suggester be notified as promptly and as tactfully as possible. Generally the suggester is contacted personally and told the reasons for rejection. In any case, a confirming letter is sent to the employee. It states the reason for rejection, thanks the suggester for his interest, and solicits further suggestions. This helps foster a favorable climate for future participation by showing management's interest in the man and his ideas.

If a suggestion is not adopted, it is retained in an active file for two years from the date it was received by the Company. After the expiration of the two-year period, the submitter of the same or similar suggestion is treated as an original submitter.

A suggestion that is not adopted may be reopened within the two-year period by the suggester or the Plan Administrators. Such might be the case if it is thought that the merits of the suggestion have not been properly recognized — or that its adoption becomes more practical after the passage of time.

Awards "Sell" Plan

The best single way to promote and publicize the Suggestion Plan is through the granting of tangible awards. In addition, prompt response and tactful rejection of the suggestion by the Company can, and will, promote employee confidence in the Plan.

Of course, there are other means of promoting the Plan. Basically, they fall into two categories: 1) Company-wide, and 2) local.

On a Company-wide basis we have available to us descriptive booklets for employees and for supervisors. News releases (particularly on outstanding achievements rewarded by the Suggestion Plan), editorials, advertisements, photographs, cartoons, and posters are provided to us by our Employee and Public Relations staff division for use at our discretion.

On the local level, we introduce the Suggestion Plan to new employees at orientation sessions. News articles and pictures of award presentations are consistent attention-getters in the *Plant News*. Occasionally we will use posters with a local appeal throughout the plant. Suggestion boxes are kept in good condition and are placed in conspicuous locations throughout the plant.

When in Rome

The General Manager of the Medium Transformer Department in Rome has delegated the administration of the Suggestion Plan to the Employee & Plant-Community Relations Section. We have appointed in this section a Suggestion Specialist who spends a major portion of his time administering the Plan.

This specialist acts as the Secretary of the Suggestion Board which consists of management people from various functions within the plant. The Board is composed of representatives from Manufacturing Engineering — (Maintenance, Methods and Planning), from Wage and Salary Administration, from Finance—(Cost Accounting), from Engineering and from Union Relations.

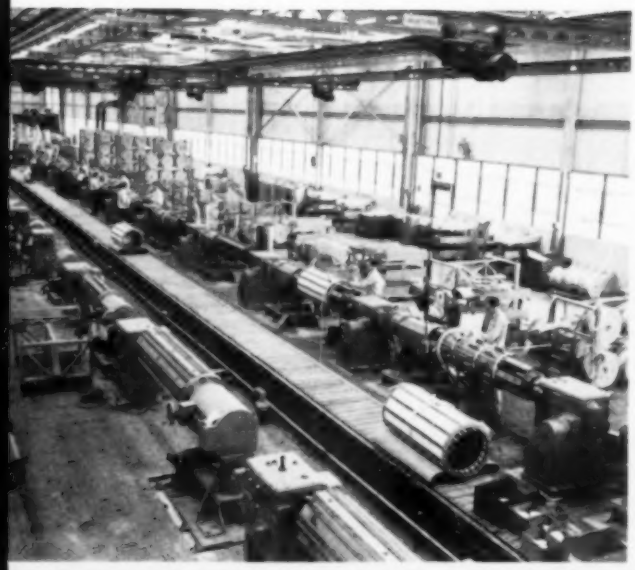
The Suggestion Board meets monthly and acts on recommendations of suggestion investigation by setting awards to be paid. The Board may also investigate suggestions of plant-wide application, or disputed suggestions, and reject or adopt them.

Suggestion processing is the responsibility of the Suggestion Specialist. He employs a clerk who spends her time logging and typing suggestions, typing award letters, letters of rejection, and related tasks. After logging and typing, the suggestion is forwarded to an individual best qualified to appraise it. Some suggestions may require evaluation by more than one individual. Others may be the same or similar to a previously rejected suggestion, and require little appraisal.

Once the suggestion is assigned it is not forgotten. The Suggestion Specialist is responsible for following the progress of each suggestion in order to assure rapid, accurate disposition. He issues periodic reports showing the status of open suggestions and informs suggesters of reasons for any delay. The Specialist arranges for presentation of awards and related publicity. He directs promotional campaigns, and in general is accountable for the overall success of the Suggestion Plan in our Department.

Measuring Results

It is a relatively simple matter to measure the success of the Plan. We use measures that indicate the value of suggestions to both the



Upper left — Employees suggestions have not only netted rewards for ideas but have helped in improved methods and improved products. Many such suggestions have been used in this winding area.

Upper right — These employees suggested a new cable for "shorting" transformers in test. The discarded bar is on the floor. A $40.00 "joint" award.

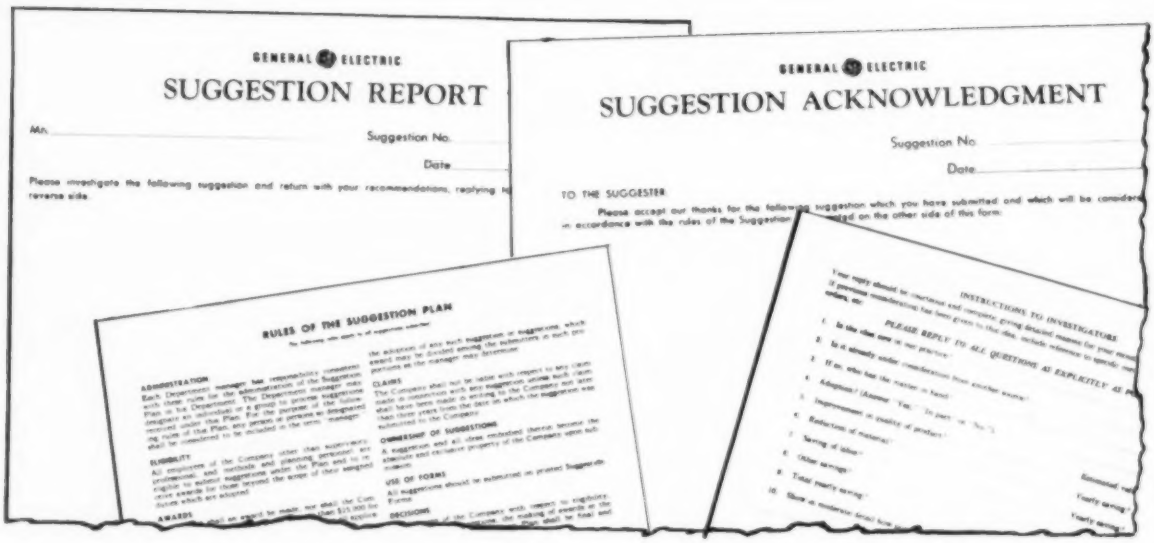
Center — This idea won $175.00. Previous transformer clamp was made of angle iron. New clamp, formed from plate stock at right, resulted in better clamp at less cost.

Lower left — A way to keep tracings flat for copying netted the plant photographer a $25.00 award.

Lower right — The suggestion was a relatively simple change in keeping track of drawing numbers — even so, it earned her $125.00.

Company and its employees. Quarterly statistics are issued in respect to awards, number of suggestions submitted, number of suggestions adopted, and estimated savings as a result of suggestions.

In 1957, our Rome Department had an average of 1,260 employees eligible to submit suggestions.



Front and back of suggestion report and suggestion acknowledgment.

During that year we processed 571 suggestions, of which 202 received awards. Awards totaled $5,178. For the employee who is interested in "Playing percentages" — better than one-third of all suggestions submitted received awards; and the average award is approximately $25.

Ideas at Work

What are the basic requirements for putting employees' ideas to work through the Suggestion Plan? Our experience indicates these factors as major points to consider:

1. ADMINISTRATION—Standard forms, rules, and procedures; pin-pointed responsibility.
2. PROCESSING — Standard procedures for rapid, unbiased processing and following of suggestions.
3. SAVINGS AND AWARDS — Consistent basis for determining savings and awards.
4. COMMUNICATION — Immediate acknowledgment of receipt of suggestion; explanation of delays in processing; rejection of suggestion tactfully with full explanation; use of the promotional advantages of awards.
5. MEASUREMENT — Standard system for keeping statistics in order to measure the results of the Plan.

Ideas can be a key to greater rewards for a company and its employees. If ideas are not heard or heeded, that key will become tarnished and rusty.

A formal Suggestion Plan can hear and heed. It will put ideas to work rapidly. That key will be kept shiny and used often to release greater benefits for all.

Supervisory Control Cuts Water Bill

THE CELANESE Corporation of America saved an estimated $14,700 last year in water processing costs as a direct result of installing supervisory control equipment at its Celriver Plant near Rock Hill, South Carolina.

The supervisory equipment, more frequently used to operate substation circuit breakers from a remote location, was adapted to start and stop pump motors as dictated by water level in a nearby reservoir.

In addition, traveling screens in the river pump intakes were automated by incorporating them in the control system.

Installation of the supervisory equipment, supplied by General Electric's Medium Voltage Switchgear Department, converted the pumping station from a manual on-off operation to a remote and automatic operation.

Maintenance and operator time has been reduced to one inspection tour per shift.

The supervisory system consists of a master control panel located at the plant's booster pumping station, and a remote panel located near the river pumps, one-half mile away. Just two telephone wires connect the master and remote stations to operate all five river pumps.

More pumps can be added to the control system without expanding the panels or increasing the number of interconnecting wires.

The Celriver Plant, which manufactures cellulose acetate and acetate yarn and staple, requires a water system of 50,000 gpm capacity for process cooling, boiler-feed make-up, drinking and sanitary purposes.

HEAT

POWER

BY-PRODUCT USE

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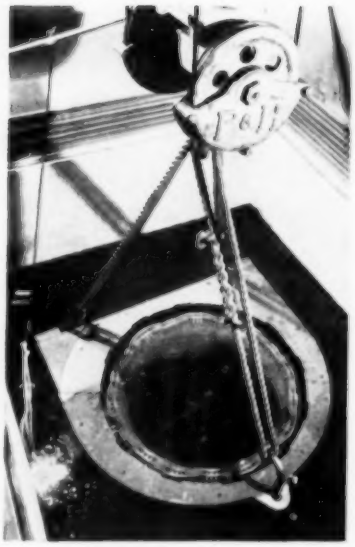
DO go near the water . . .

MOTOR INSULATION



ABOUT the last thing you'd expect a big manufacturer to use in developing an electric motor is water. But Allis-Chalmers has been steadily falling back on just plain aqua pura to put over the point that an insulation it developed is mighty water resistant. It's resistant to abrasion and chemicals, too, and fights off age like all get-out.

Plant personnel who have visited Allis-Chalmers' exhibits at various trade shows are well familiar with the famous bowl of fish in which an electrified part of a motor is immersed. The fish make out well show after show. Photo shows another recent test. Engineers immersed an entire stator from a 500 hp motor in water and shot in 18,000 volts. That's 9000 more than is normally given a motor of that type in an open air test. The insulation really works!

RECENT insulation strides have advanced open-type motor applications. One factor is an all-silicone-rubber insulating system for form-wound stator coils in large motors. Another is epoxy-encapsulated coil structures for field windings of large synchronous motor rotors and for stators of smaller frame motors with random or mush-wound coils. Allis-Chalmers utilizes both in its "Super-Seal line of open motors.

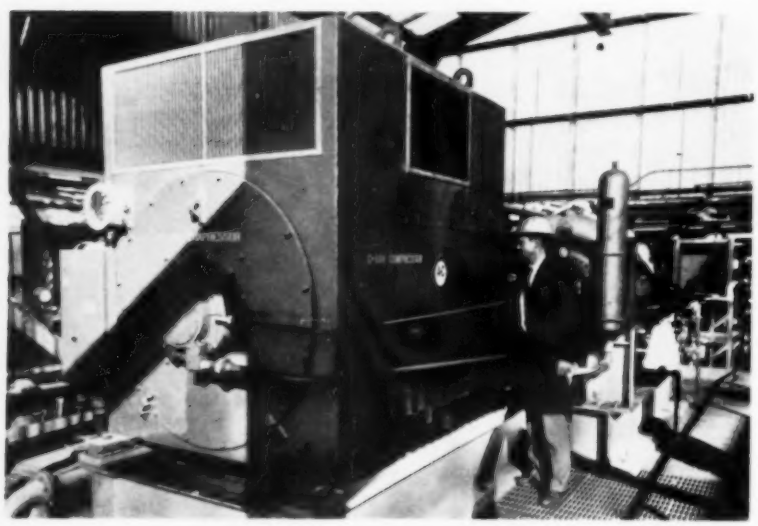
Properties — silicone rubber insulation for coil windings is vulcanized into a solid dielectric wall without joints, voids or breaks. It is, for all practical purposes, unaffected by humid conditions. Dryouts are a thing of the past.

Since silicone rubber insulation is moisture repellent even in high humidity, condensate, if it should form, will do no damage. Insulation resistance is reduced very slightly after long periods of immersion, but not to the point of electrical breakdown.

Industry Applications — Large quantities of water used in paper production have presented problems where drip or splash protection proved inadequate. Some plants have specified water-cooled enclosures to keep moisture away from coils.

Silicone-rubber-insulated open motors have been applied in some of these areas rather than totally enclosed, fan cooled types, at a saving of up to 60%. Epoxy-encapsulated motors have successfully replaced totally-enclosed motors on industrial type washers.

The ability to hose down open motors with moisture-resistant insulations is especially appealing to rubber-mill and plastics manufacturing engineers. Operating experience has proven that silicone-rubber-insulated coils are unaffected by a carbon black concentration that quickly breaks down conventional coils. Epoxy structures also have no breaks or



Outdoor motor rated 3500 hp at 2300 volts drives a compressor at a Louisiana oil refinery. Allis-Chalmers motor has a Super-Seal (all-silicone-rubber) insulation system which can be used where atmospheric conditions would destroy the effectiveness of conventional insulations.

The Yarway Impulse* steam trap is the only steam trap that continually senses condensate conditions in the line ahead of the trap, and discharges this condensate as soon as it forms.

Result—higher temperatures, steadier temperatures, peak operation of steam heated equipment at all times.

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* du Pont trademark

Developments in Motor Insulation

openings through which these carbon particles can penetrate.

Abrasive dust blasting across exposed coil ends seriously degrades varnished coil structures. The same dust literally bounces off the rubbery insulating walls of silicone-insulated coils.

Field coil structures on synchronous motor rotors have long been vulnerable to penetrating dust particles. Since these machines are commonly applied in metals - processing plants, they have often created maintenance problems. Field coils, protected with an epoxy resin laminate, are sealed to form a glass-like surface to which dust particles will not adhere.

In the chemical and petroleum industries epoxy encapsulated motors as well as silicone-rubber-insulated open units can safely be used in outdoor locations where enclosed motors previously were specified. Savings of up to 60% are obtainable relative to TEFC motors. At least a 35% savings can be expected over the cost of weather-protected enclosures.

An epoxy encapsulated motor, substituted for a totally enclosed type, drives an acid pump in a chemical plant, where it is subjected to acid fumes and dripping moisture. No detrimental effects have been noted after more than 18 months of service.

In another application, TEFC motors failed to provide adequate service in a fertilizer plant application. Extremely fine foreign particles, in humid air, were drawn into the motor enclosure by normal breathing of the motor in intermittent service. The combination formed an acid strong enough to destroy the insulation. Encapsulated windings in an open frame again proved to be the reliable answer.

Insulation systems using silicone rubber are not damaged by oil or solvents. Commercial cleaning solvents have no adverse effect on silicone-rubber insulation.

Economy — a big percentage of general purpose motors in use today are totally-enclosed. Development of tube-type cooling made TEFC construction practical for large machines and made possible explosion-proof ratings to meet many industrial requirements.

In some applications total enclosures with built-in air to water heat exchangers were used to keep windings free of contaminants. A variation of this construction, pressurized with an inert gas, is also used for explosive areas. A third type of total enclosure is pipe or forced-ventilated.

Although total enclosures represent today's ultimate in motor protection, they are considerably more expensive than open types. Large TEFC ratings cost about 100% more than an equivalent basic open motor. Forced - ventilated types are initially less costly, but the expense of ductwork and ventilating equipment must be considered. Water-cooled types depend on a reliable source of cool water and cannot be used out-of-doors in freezing temperatures.

Weather-protected types of enclosures are designed primarily to keep moisture away from insulated parts. A system of shields and baffles reduces incoming air flow. Protection built into silicone-rubber-insulated motors gives "outdoor" motor capability at up to 50% savings.

Forced-air cooling can range as high as 60% more than the cost of silicone rubber or encapsulated open motors. Pipes and external ventilation schemes are designed to insure an uncontaminated supply of air in contaminated locations. Filters or precipitators designed to remove dust often complicate such systems and add to their expense.

Finding increasingly more favor with powerhouse designers is the outdoor motor idea. Savings in construction dollars is also being utilized by pipeline operators and industrial users too. The built-in protection inherent in silicone-rubber-insulated motors now will serve most of these outdoor applications. In addition, these new motors include the standard service factor of standard open motors.

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At Listerhill, Alabama . . .

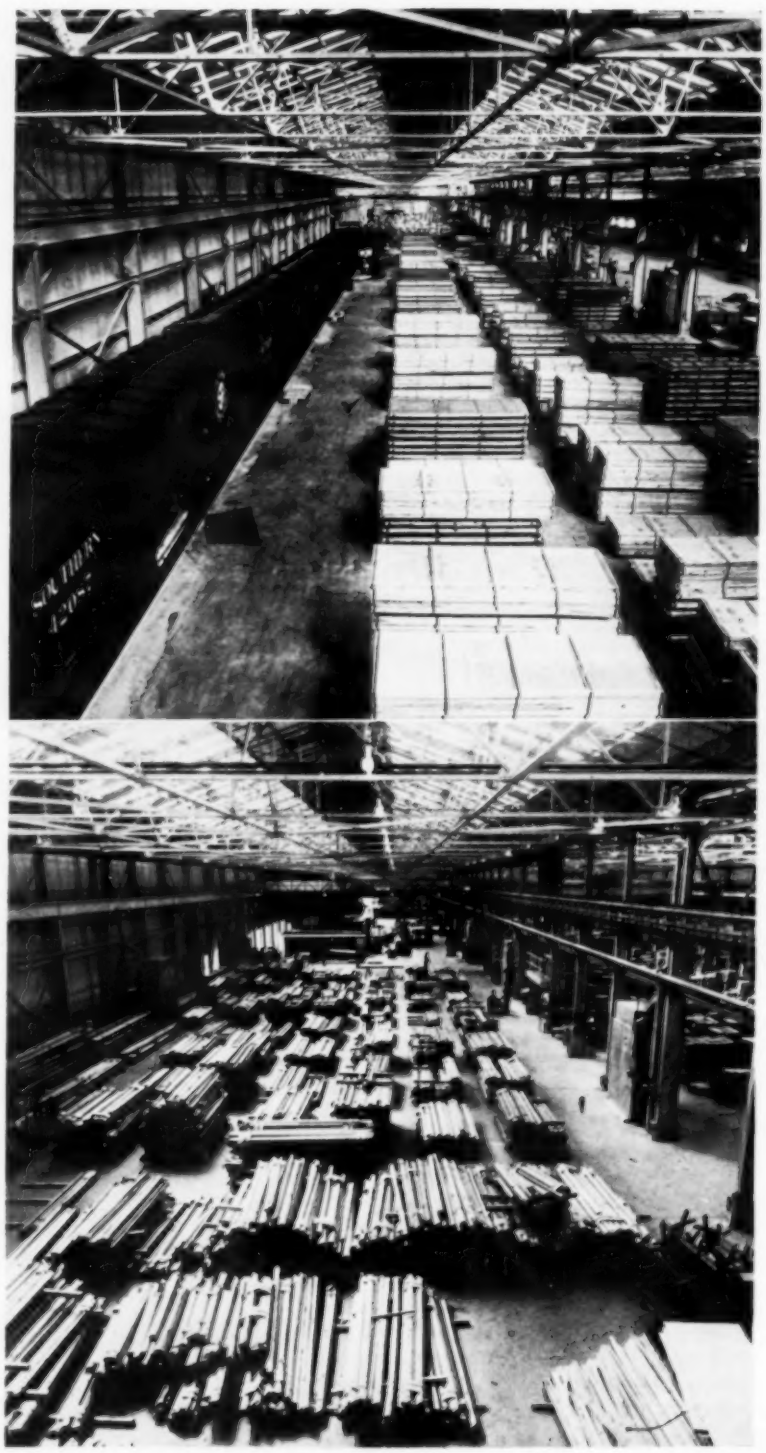
SHIPPING FACILITIES — Modern and Centralized

A NEW GIANT shipping building is speeding shipments of fabricated aluminum from Reynolds Metals Company's big alloys plant at Listerhill (Sheffield) Alabama. This is the first major unit to be completed under the expansion program underway at the plant, which will include what is believed to be the world's largest hot mill for rolling of aluminum sheet.

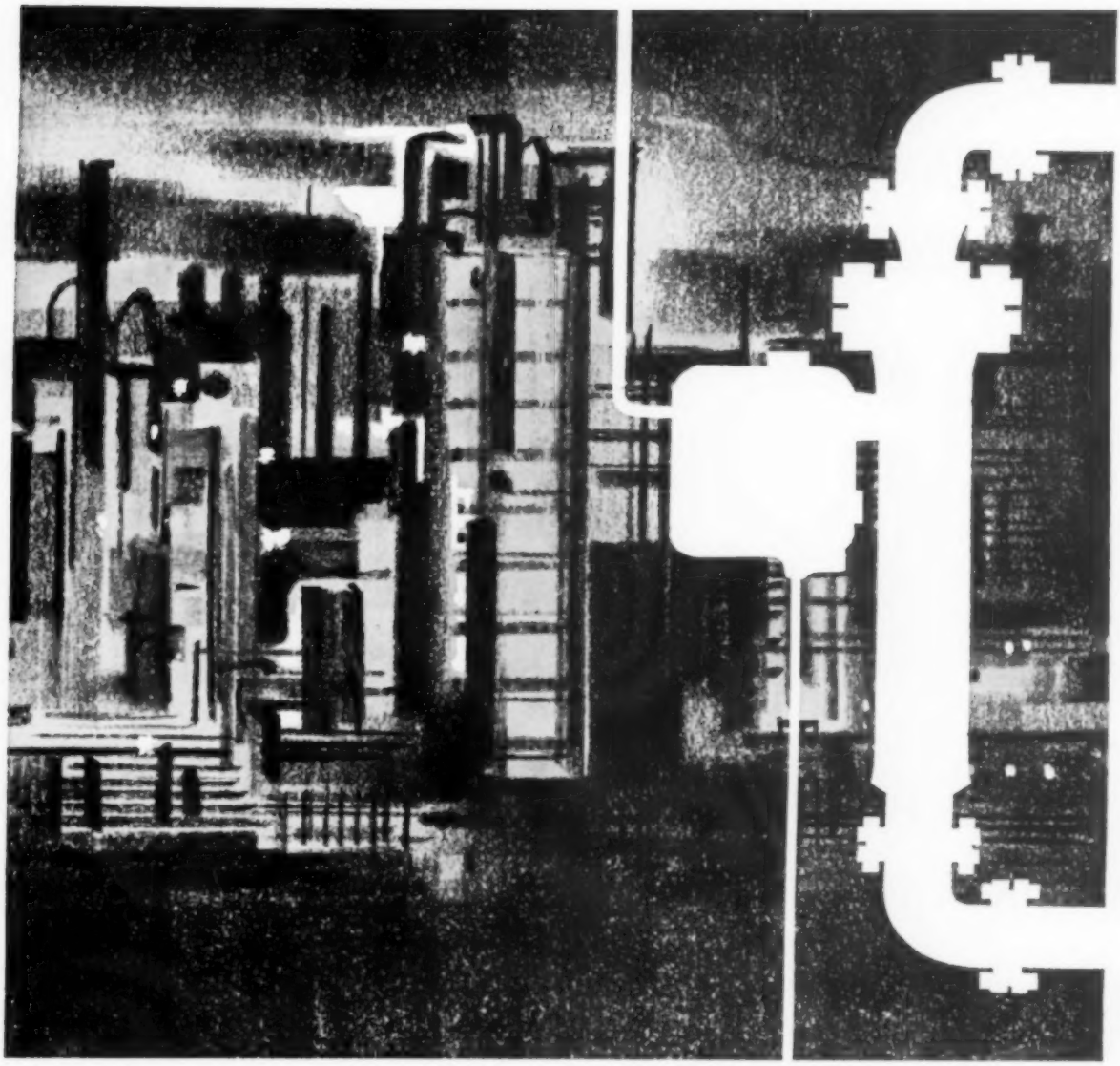
One bay is 712 ft long and the other is 832 ft long. Both bays are 80 ft wide and 43 ft high. There is an adjoining 420 by 18 ft side extension of the shorter bay to cover a depressed railroad track. This track and another one, also fully within the building, total 832 ft in length. For trucks there now are five depressed loading docks inside the building plus an outside loading dock.

The new 150,000 sq ft shipping building replaces a scattered group of operations in the sprawling complex of mills where products as varied as aluminum sheet, foil, rod, bar, cable and tubing are manufactured from aluminum produced at the two adjoining Listerhill reduction plants.

Four P&H (Harnischfeger) overhead traveling cranes, each of 10 tons capacity, are in service and a fifth is to be installed later. Four fork lift trucks are employed: 3-3000 lb Clark, 1-4000 lb Clark, and 1-6000 lb Yale. The truck dock is provided with Kelley Hi-Lo automatic lift dock boards.



Aluminum sheet (above) and structual shapes (below) are shown packaged and ready for rail or truck shipment.



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SINCE 1880

GOOD LIGHTING a Tool for Production

A LOT OF MONEY is spent in offices for floor space, furniture, business machines, skilled workers and experienced, capable, executive personnel. But too often these important industrial workers are literally blindfolded and handicapped in doing their work with accuracy and speed because of poor lighting. Moreover, an office should have a degree of aesthetic atmosphere and that too, is reduced in its effectiveness when lighting is below accepted standards.

The lighting environment has a psychological effect on the office workers which plays a very important part in employee alertness and efficiency. In addition, a pleasant, well lighted office conveys a progressive, successful atmosphere, which builds higher prestige.

Lighting Qualities

The workers in offices are required to see relatively fine details for long periods of time. The contrast in carbon copies, penciled notes, typing and printing on thin and low-grade paper are often so feeble that accurate and speedy discernment is difficult.

A high level of illumination is needed to improve seeing when there are poor contrasts in written or printed material. The added light makes the type or written characters stand out from the immediate area around them. In offices where stenographic work is done, 70 to 100 foot-candles of illumination should be provided. In areas where there is continuous close work, reading blueprints, etc., the level of illumination should be 150 foot-candles.

While seeing depends largely on contrasts between objects and components, brightness contrasts between adjacent areas should be minimized. Relatively dark and light areas with severe brightness differences are to be avoided because it is difficult for the eye to adapt itself to two brightness values in the same field of view. If the room is painted in light tones throughout, there will be less danger of severe brightness contrasts. An unshielded window in the field of view may be painfully bright in contrast with the wall adjacent to the window. Desk tops should be very light in color. Black, dark gray or dark brown desk tops which are most often provided are not desirable. Ceilings should be painted flat white to minimize contrast with the lighting equipment.

This office illuminated by a luminous ceiling illustrates flexibility of office arrangement. Partitions can be placed so that appearance and lighting will not suffer.

The maintenance department has good lighting too, supplied by four fixtures arranged in U shape. Excellent distribution is achieved by this arrangement.

The painting of walls in light colors provides interest and decorative value. Dark colors should always be avoided because they not only absorb otherwise useful light but also create unfavorable brightness contrasts.

In some parts of the plant shadows have a value since they aid in determining the shape of objects. Even here, the shadows should be soft and feathery-edged. But shadows in the office are to be avoided. This is particularly true in drafting rooms where shadows cast by the straightedge and other drawing equipment can become very troublesome. Uniform illumination throughout the office will minimize undesirable shadows.

Glossy surfaces also can be a source of troubled seeing. Reflected images from such surfaces may not only hinder seeing, but cause acute discomfort or even headaches when exposure is prolonged. Shiny surfaces of typewriters, adding machines and glossy desk tops create reflections which can be very annoying. Glass desk tops should never be used, for even under the best lighting conditions, reflections from them seriously hinder good seeing.

Types of Equipment

The purpose of a fixture is to shield the lamps from direct view and to distribute the light at best possible efficiency. There are several types of lighting systems: direct, semi-direct, general diffuse, indirect, and semi-indirect. These designations are determined by the manner in which they distribute the light.

In direct lighting systems, all of the light is directed downward below the horizontal. Illumination from these systems can be harsh and spotty and shadows will be sharp and well defined. These systems are not recommended for use in offices.

A semi-direct fixture directs the majority of light downward but a small amount of light escapes upward. Thus, "the tunnel effect" created by the dark ceiling with direct lighting systems is reduced. There is still not sufficient upward light to be reflected from the ceiling and thereby soften the sharpness of the direct light. Therefore, this type of fixture is not too desirable for an office.

A general diffuse system or direct-indirect as it is sometimes called, permits about half of the

By ROY A. PALMER
Duke Power Company
Charlotte, North Carolina

PART II —— Industrial Offices

Aluminum troffers recessed on 3-foot centers, contain continuous rows of one 40-watt fluorescent lamp. Shadows are minimized by light in any direction from the closely spaced units.

light generated by the lamp to be directed downward while the balance is directed upward. This is a more desirable type of system since some of the disadvantages of the direct system are overcome.

The best systems of all are indirect and semi-indirect because they provide excellent quality illumination. The indirect system directs all of the light upward to the ceiling from whence it is reflected downward. Because of the large area of the ceiling compared to the projected area of the fixture, the shadows are eliminated and high levels of illumination are most comfortable.

The semi-indirect system employs fixtures which allow enough light to escape through the fixture to make it luminous, thus considerably enhancing their appearance against the well-lighted ceiling. Where these systems are used, the ceilings must be painted flat white and the fixtures kept clean by frequent cleaning schedules.

A luminous ceiling consisting of large areas of translucent plastic above which is placed a series of lamps actually is a "direct" system, but because of its large area, it becomes, in effect, an indirect lighting system. The popularity of luminous ceilings is no doubt due to its good lighting qualities and its good appearance.

Since the lamps are concealed above the diffusing medium, it is possible to add more lamps as it becomes necessary to increase the illumination. For example, if the type of work in the office was changed from intermittent, casual work to a drafting room where detailed, prolonged work is done, it would require a higher level of illumination. More lamps can be added to raise it from 70 or 100 foot-candles to 150 foot-candles with relatively low cost.

How to Select Fixtures

Of course, cost is an important item when new fixtures are to be purchased for the office. But as with almost everything else, factors of quality and performance are important too. In fact, many fixtures bought solely on price become more costly in service because factors other than price were not considered.

Knowledge about various types of lighting systems as outlined above will assist the designer and purchaser in selecting the right type for the job. Then there are such things as efficiency, distribution, sturdiness, ease of maintenance, and appearance, all of which should be considered.

Efficiency is an overworked word in many things as well as lighting fixtures. Obviously, the more the lamps are exposed or unshielded the more efficient the fixture may be. But the lamps should not be exposed so that their brightness will hinder rather than assist seeing.

The design of the fixture should provide the type distribution which the lighting layout requires. This design will also involve protection against glare — both direct and reflected glare. If the fixture properly diffuses the light, it will guarantee this protection.

Sturdiness can assure long life and low service costs. Flimsy parts may buckle and absorb time of the maintenance man. All fixtures need periodic cleaning. The ease and facility with which they can be cleaned may easily justify a higher priced fixture over one having a low price.

The matter of appearance may be a decision of personal choice but good judgment will dictate the selection of fixtures which conform to the architectural features of the room. Frills and decorative additions tending toward garishness will not improve the appearance or the lighting result. There is a sufficient variety of equipment on the market to enable a choice which will express individuality and good looks.

Fixture Arrangement

When a lighting layout is planned, the spacing, mounting, and number of fixtures is developed in accordance with the architectural features of the structure and the amount of illumination required.

In large office areas, partitions may be changed or added. Consideration should be given to this possibility because small offices created by added partitions require more lamps to maintain the original level of illumination. This is due to the fact that the added partitions create more wall area in proportion to the floor area, thereby more light is absorbed by them.

This can be provided for in advance when the lighting is first planned by bringing spare circuits to junction boxes located at intervals between rows of fixtures. The junction box located at the wall above the ceiling can be reached by removing a ceiling acoustical tile or by some similar method. If an extra row of fixtures is required, they can be wired from this junction box and the fixture channels will provide the raceway for connecting each fixture.

The advantage of this preparation not only comes in furnishing more needed light for small offices created by partitions, but also permits increasing the illumination in the same work area if necessary. History has shown that illumination levels are constantly going upward. Today's levels will seem low in a few years just as we think of 1940 levels today. Higher output light sources and greater knowledge in conserving and sharpening our vision will bring this about.

Several manufacturers of lighting fixtures mark their equipment "RLM Standard." This means "Reflector Lamp Manufacturers' Standard." An independent testing laboratory is retained to select samples of their equipment at random and put them through tests to determine their adherence to standards of metal gauge, whiteness of enameled reflecting surfaces, efficiency of light output, shielding and many other similar checks of quality.

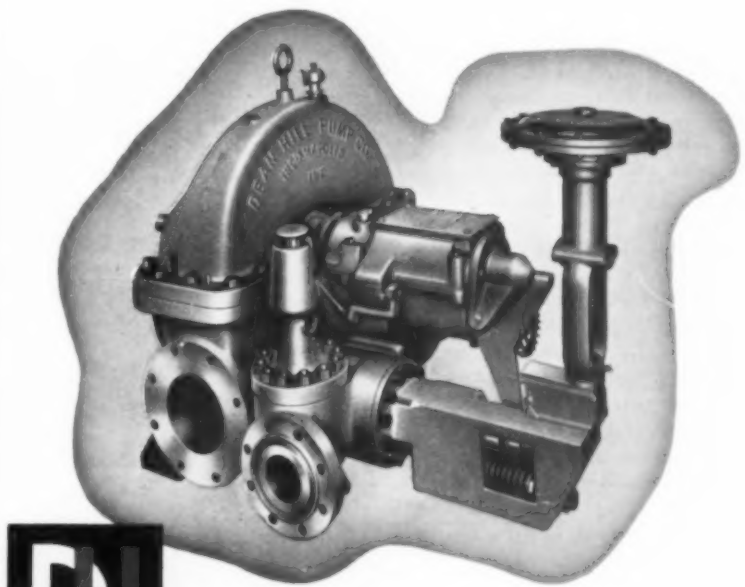
A similar organization, Certified Ballast Manufacturers, submit ballasts for test by an independent testing laboratory. Thus purchasers can be assured of ballasts which meet standards of quality.

Supplemental lighting such as desk lamps, lamps on extension arms, etc., do not generally have a place in an office. Their presence is an indication that the general lighting is inadequate. Portable lamps in reception rooms and private offices can be used for decorative purposes, but they should not be relied upon as important sources of illumination.

The great fault with lighting installations in most corridors is that lighting units are spaced too far apart. This creates alternate light and dark areas which are not too pleasant. Spacing the lighting units not more than 1½ times their mounting height from the floor will assure better results. Closer spacing of course is more desirable. This is because the corridor should not present too great a change in illumination level as one enters it from a well-lighted office. Also, safety and appearance are important.

Well lighted washrooms help to promote good housekeeping. General lighting from fluorescent or incandescent units should be supplemented by special lighting at mirrors.

Good lighting for the office is just as much a tool for production as lighting in the work areas of the plant.



D-H *turbines with pressure regulators solve constant fluid pressure problems*

Dean Hill Turbines equipped with types 643-A and 654-A Fisher pressure regulators are "made to order" for boiler feedwater applications requiring precise, automatic pressure control. Regulators can be used with any turbine model of either horizontal or vertical design and are furnished with direct-acting or remote control. They can be arranged to maintain a constant pump discharge pressure or a constant differential pressure over the boiler pressure.

The regulator controls all turbine speeds up to normal rating, but above this point the turbine governor overrides the regulator to prevent overspeeding. The emergency trip-valve remains independent.

To effect maximum efficiency of control and eliminate lost motion and deflection, the regulator is mounted on a rugged support made of high tensile strength cast iron.

For further information on D-H Turbines and optional accessories write today for Catalog 500.

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Pump and Turbine Engineers Since 1893
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Flood water is pumped into storage lakes for irrigation . . .

Big Pumps in Florida

SOME of the world's largest pumping stations have lifted flood after flood from Florida farm lands and saved millions of dollars in crops. From January 1957 through March 1958, thirteen diesel-driven pumps moved more than 285 billion gallons of water. According to unofficial estimates, the savings achieved by the Central & Southern Florida Flood Control District's pumps exceeded $44,000,000.

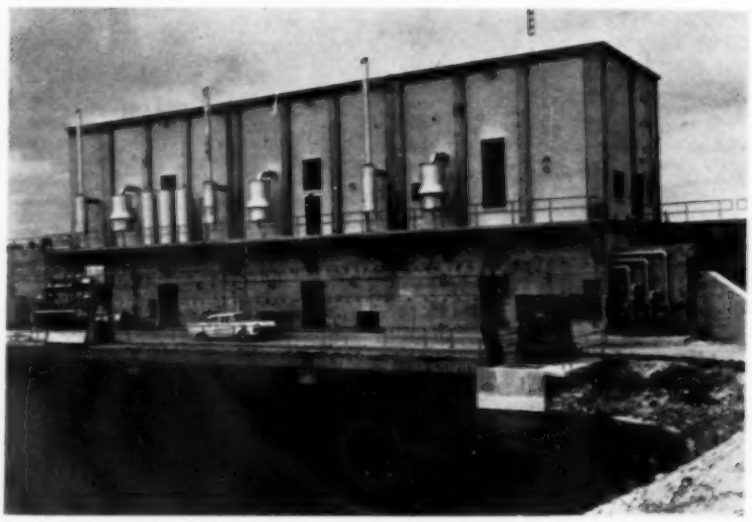
Flood Control System

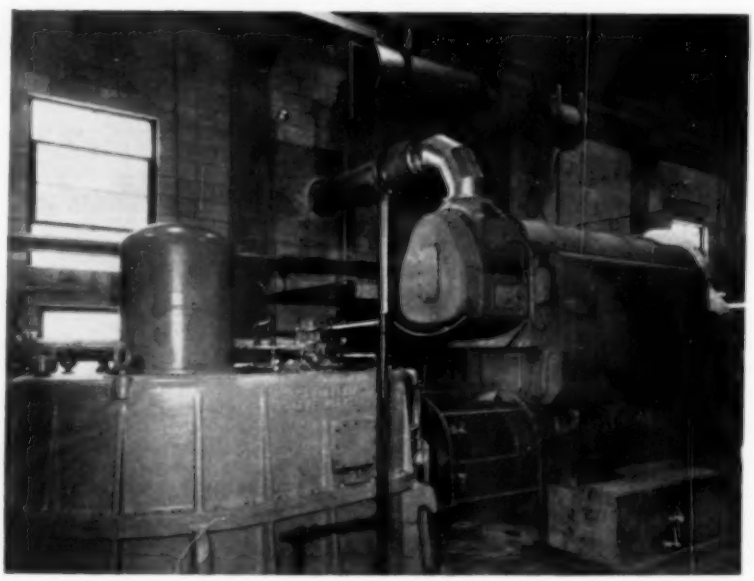
These pumping units are part of a gigantic system of canals, levees and conservation areas designed to control the raging waters that for centuries have brought death and destruction to Florida farms and cities. Planned and designed by the Jacksonville District, Corps of Engineers and financed jointly by Federal and State governments, the system controls water level in the canals and in Lake Okeechobee and stores excess rain water either in the Lake or in a 1500-square-mile conservation area for use in irrigating farm land during the dry months.

Latest Pumping Units

Station 3 (illustrated here) is the newest in the system, and handles a drainage area of 129 square miles. The view of the suction side of the structure shows the Maxim exhaust silencers, American air filters and the S. Morgan Smith trash rack rake.

There are three 960 hp Fairbanks-Morse opposed-piston diesel engines driving F-M vertical axial flow pumps rated at 860 cfs each at a 6.4 ft head. Pumps are driven through Philadelphia Gear Works right angle hollow shaft reduction gears.





Units are served by Air Maze full flow lube filters, Roper prelube pumps, and a Farval automatic lubrication system that supplies grease to the main pump bearings. The pumps are primed by a Nash Hytor vacum pump. Impellers are 131.5" diameter, and operate at 71.9 rpm.

Industrial Insulation

FUNDAMENTALS of industrial insulation are summarized in a new practical handbook compiled for distribution by The Aber Co. of Houston. The 16-page book, written for the insulation buyer, foreman and maintenance superintendent, presents solutions to a few of the field insulation problems. Three sections cover general fundamentals, special considerations of hi-temp insulation, and of low temperature insulations.

For your free copy write: The Aber Company, Inc., Box 2535, Houston, Texas.

How to Clean Air Conditioning Units

THESE suggestions on how to properly clean industrial air conditioning units are offered by Betz Laboratories, Inc., consultants on industrial water conditioning problems.

1. Dry out the unit by stopping the water circulating pumps and permitting the air to circulate for a period of one to two hours. Then stop air circulation.

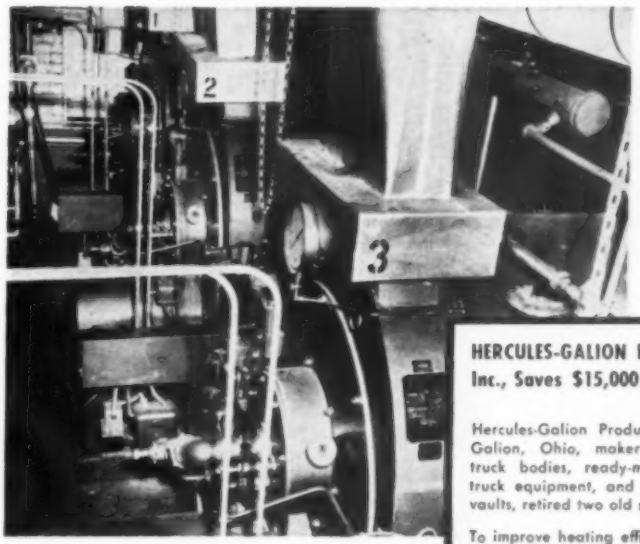
2. Clean units by manual methods, utilizing a high pressure steam hose, air or water.

3. Drain and flush units, then refill with fresh water.

4. Sterilize units. With the fan off, circulate a chlorine treatment for one to two hours using the water circulating pumps. Note: For every 100 gallons of water held in the unit, add *any one* of the following: 25 fluid ounces of Chlorox, *or* 12 fluid ounces of Sodium Hypochlorite, *or* 2 ounces of Calcium Hypochlorite (H. T. H., Perchloron or Pittchlor).

5. Drain and flush unit.

6. Refill with fresh water and resume normal treatment for scale and corrosion.



HERCULES-GALION PRODUCTS, Inc., Saves $15,000 Per Year!

Hercules-Galion Products, Inc., of Galion, Ohio, makers of dump truck bodies, ready-mix concrete truck equipment, and steel burial vaults, retired two old style boilers.

To improve heating efficiency, they installed three Cyclotherm 125 h.p. combination light oil/gas package steam generators. The total savings per year comes to $15,000.

As growing production or expanding plant facilities require more steam, Cyclotherms can be added when needed.

CYCLOTHERM

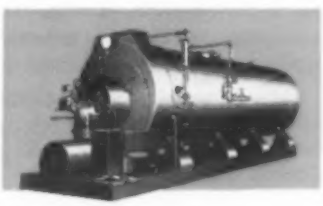
Steam capacity that grows with the plant!

When you recommend Cyclotherm Steam Generators you recommend a steam source that can be quickly and economically expanded to meet plant expansion. For Cyclotherm's wide range of capacities permits the addition of exactly as much new capacity as may be needed at any time. Will 518 lbs. of steam per hr. suit the requirements? That's what a 15 HP Cyclotherm produces. Or are 25,875 more steam lbs. per hour wanted? In that case, a 750 HP Cyclotherm fills the bill. And between these extremes there are sixteen intermediate sizes to choose from.

Compact Cyclotherms are also kind to boiler room space – the Cyclotherm is up to ⅓ smaller than the ordinary package boiler. Installation is easy – no costly stack, no excavation, no foundation. The Cyclotherm is shipped complete – ready to operate. Burner and boiler are built together to work together with *one* manufacturing responsibility back of the entire unit.

Cyclotherm's Cyclonic Combustion guarantees a minimum of 80% efficiency. Larger units operate at from 30% to 100% of rated capacity with no loss of efficiency. Smaller units operate on and off automatically according to load requirements. With simpler design and fewer parts, Cyclotherm reduces maintenance costs by from 30% to 50%. Cyclotherm's world-wide service organization gives prompt service on every call. For full information, write us today.

There are 18 Cyclotherm models, ranging from 15 HP to 750 HP. Burns oil and/or gas. The Cyclotherm meets all state requirements and is built in accordance with A.S.M.E. and National Board Standards and bears the label of Underwriters' Laboratories, Inc. Guaranteed against any defect in materials or workmanship. Cyclotherm also manufactures a complete line of Hot Water Generators in 10 capacities, from 670,000 BTU per hr. to 6,700,000 BTU per hr.



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Nuclear Developments

New Uses . . New Plants . . New Research . . New Contracts

THIS MONTH the author discusses national rather than regional nuclear developments, because many events of broad geographic scope are of specific business interest to engineers in the area served by SPI.

By JOHN F. LEE
SPI Consultant on Atomics and Professor of Mechanical Engineering North Carolina State College

Cheaper Isotopes

REDUCTION in the price of radioisotopes has great importance for a wide variety of industries in all areas. Generally, the new prices put into effect by the Atomic Energy Commission are less than 10% of those formerly in effect for Cesium 137, Promethium 147, Cerium 144, Strontium 90 and Technetium.

The greatly reduced prices are expected to encourage more widespread distribution and use of the radioisotopes in industrial, medical and research applications.

The reductions are based on estimated production from the new Multicurie Fission Product Pilot Plant at the Commission's Oak Ridge National Laboratory, Oak Ridge, Tennessee. The pilot plant, will recover usable by-products of the fission process. The previous laboratory facility was capable of production on a limited scale only.

Depending upon the quantity purchased, the new prices per curie range from $1 to $2 for Cesium 137, $1.75 to $3.25 for Promethium 147, $1 to $2 for Cerium 144, and $5 to $10 for Strontium 90. Technetium 99 is priced from $80 to $140 per millicurie. The previous prices per curie were $14 for Cesium 137, $500 for Promethium 147, $1,000 for Cerium 144, and $500 for Strontium 90. Technetium 99 was $1,000 per millicurie.

Uses of Isotopes

The lower prices were established in advance of plant operation to give medical and research institutions and industry opportunity to prepare for large-scale use of the radioisotopes.

Cesium 137 is being used in medical therapy for treatment of cancer, and in industry for industrial radiography, density gauges, and liquid level gauges. It is also a potential radiation source of high power output for industrial operations such as induction of chemical reactions, polymerization, and sterilization of drugs and surgical supplies.

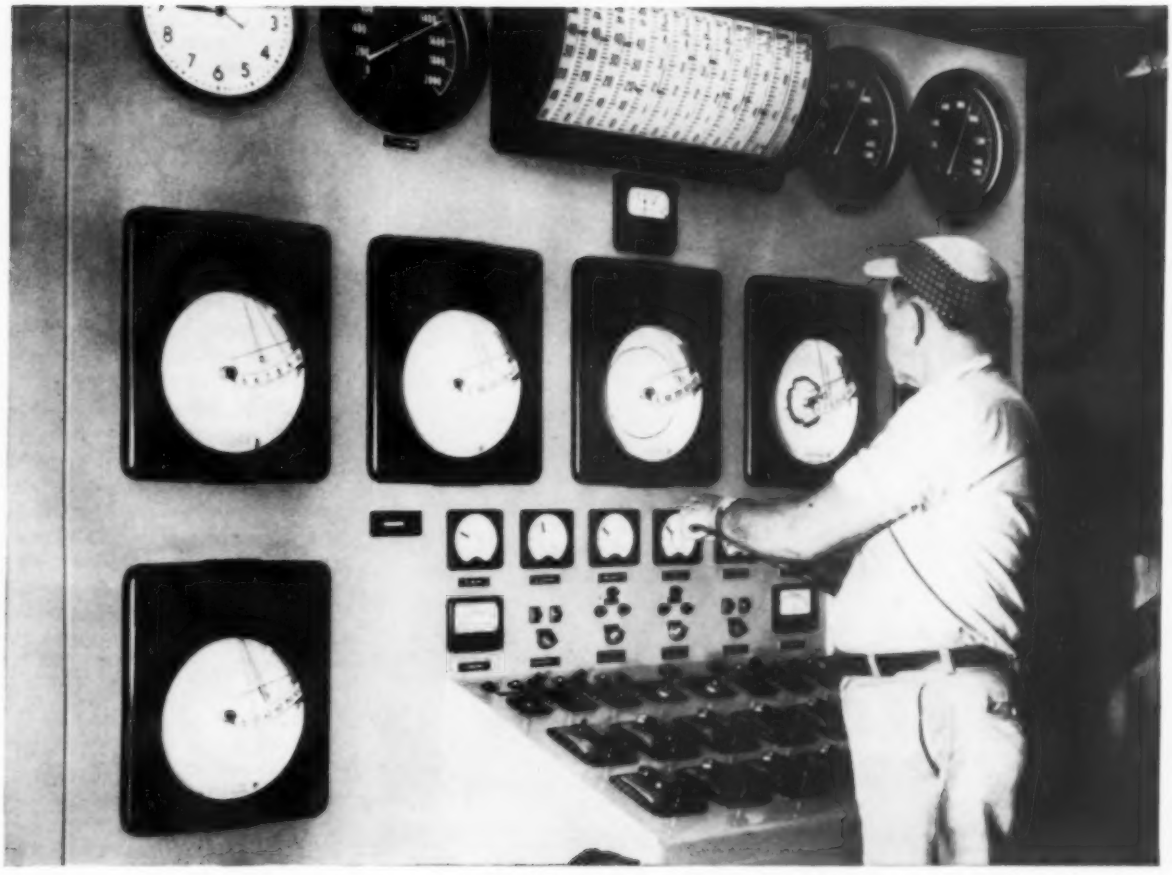
Promethium 147 and Strontium 90 have a number of industrial applications, such as in self-luminous sources and atomic batteries. Strontium 90 also is employed in industrial thickness gauges and in medical applicators for treatment of some eye conditions.

Because of previous limited availability and high cost, Cerium 144 and Technetium 99 have not yet found widespread use. Some research, however, has indicated the possible use of Technetium as a corrosion inhibitor for metals. With the increased quantities and reduced prices now established for these two fission by-products, it is expected that industry will give increased attention to finding new applications for them.

The 5 radioisotopes now made available at sharply reduced prices are among approximately 40 radioisotopes created by nuclear fission during operation of reactors. The 5 are the principal ones having long half lives.

The fission by-products appear in the solutions left over from chemical processing of spent reactor fuels to recover "unburned" uranium. Separation of the individual radioactive fission by-products is accomplished by additional chemical processing of the leftover solutions. The Multicurie Fission Product Pilot Plant is specifically designed for making these chemical separations.

With the continued growth of atomic power in the United States,



Control Room for Cyclone Furnace Boiler at Mathews No. 2 Power Plant of Greenwood Mills, Greenwood, S. C. Bailey MINI-LINE System concentrates controls at operator's station.

How BAILEY simplifies operation of STEAM PLANTS

Your operators can work more efficiently, make adjustments faster when you put Bailey Controls at their finger tips.

Bailey is the choice of virtually all the most efficient plants on the Federal Power Commission's heat rate report.

Here's why:

1. A Complete Line of Equipment

You can be sure a Bailey Engineer will offer the right combination of equipment to fit your needs.

Bailey manufactures a complete line of standard, compatible pneumatic and electric metering and control equipment, that has proved itself. Thousands of successful installations involving problems in measurement, combustion, and automatic control are your assurance of the best possible system.

2. Experience

Bailey Engineers have been making steam plants work efficiently for more than forty years. Veteran engineer and young engineer alike, the men who represent Bailey, are storehouses of knowledge on measurement and control. They are up-to-the-minute on the latest developments that can be applied to your problem.

3. Sales and Service Convenient to You

There's a Bailey District Office or Resident Engineer close to you. Check your phone book for expert engineering counsel on your steam plant problems.

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New Prices of Radioisotopes

	Quantity Purchased (Curies)	Price Per Curie	Half Life
Cesium 137	Less than 20,000	$ 2.00	
	20,000-100,000	1.50	
	Greater than 100,000	1.00	30 ± 3 years
Promethium 147	Less than 20,000	3.25	
	20,000-50,000	2.50	
	Greater than 100,000	1.75	2.6 years
Cerium 144	Less than 20,000	2.00	
	20,000-100,000	1.50	
	Greater than 100,000	1.00	282 days
Strontium 90	Less than 500	10.00	
	500-5,000	7.50	
	Greater than 5,000	5.00	25 years
Technetium 99	Less than 100 mc	140.00 per mc	
	100-1,000 mc	110.00	
	Greater than 1,000 mc	80.00	212,000 years

Source encapsulation and packaging charges extra.

ever-increasing quantities of these radioactive fission by-products will be produced. Although often referred to as radioactive "wastes" for which safe disposal methods must be devised, it is expected that their potential economic value ultimately will be realized through further development of beneficial uses in industry, medicine, and research.

The accompanying table lists the new prices in detail:

Nuclear Power

◆ The Atomic Energy Commission advised the Congressional Joint Committee on Atomic Energy that it will forward to the Congress a request for specific legislative authorization of a cooperative arrangement with Pennsylvania Power and Light Company and Westinghouse for Commission assistance to the companies' power reactor project.

◆ The Commission is inviting proposals from industry for the design, development, manufacture and test operation of major non-nuclear components for use in all reactor systems which use liquid sodium as coolant.

Components proposed for development initially are steam generators, heat exchangers and flow control mechanisms. Proposals will be invited at a later date for other components.

The Commission is calling upon industry to help develop reactor components which are exposed to liquid metal coolants and suitable for operation under conditions necessary to provide the high steam temperatures and pressures required in modern electric generating stations. The development program will complement work now being conducted by the Commission on advanced sodium cooled reactor systems.

◆ The AEC has announced that it has reached agreement with the Nuclear Products-Erco Div. of ACF Industries, Inc. and the Rural Cooperative Power Association, Elk River, Minnesota, on the basis for contractual arrangements for a demonstration nuclear power plant at Elk River. The reactor would use water as a moderator and coolant, and a mixture of thorium and uranium oxides, as fuel.

◆ The Commission has also agreed with the Atomics International Division of North American Aviation, Inc., and the City of Piqua, Ohio, for contractual arrangements for a demonstration nuclear power plant at Piqua. The agreement with Atomics International would cover research, development, fabrication and construction of a 12,500 electric kilowatt nuclear reactor moderated and cooled by a high boiling point hydrocarbon and fueled by slightly enriched uranium.

◆ The Atomic Energy Commission has selected the Bechtel Corporation, of San Francisco, California, as the architect-engineer for the nuclear reactor to be constructed at Hallam, Nebraska, by the Commission under a cooperative arrangement with the Consumers Public Power District of Nebraska. The nuclear power plant will be operated by Consumers as part of its electrical generating system.

Nuclear Ship

The keel of the NS Savannah, the world's first commercial atomic vessel, was laid on Maritime Day, May 22. The NS Savannah is named in honor of the SS Savannah, first steamship to cross the Atlantic. When President Eisenhower announced in October, 1956, that he had directed the Atomic Energy Commission and the Department of Commerce to proceed with the design and construction of the first nuclear-powered merchant ship, he said: "This new vessel will be a floating laboratory, providing indispensable information for the further application of atomic energy in the field of ocean transportation."

The nuclear ship Savannah will be a combination passenger-cargo vessel, 585 ft long and 78 ft wide, capable of carrying 60 passengers, a crew of 100, and 10,000 tons of cargo at a speed of 20¼ knots, for 2½ years without refueling. The reactor, which is being built under the supervision of the Atomic Energy Commission by Babcock and Wilcox, will use a pressurized water system of advanced design. Total cost of the ship will be over $30,000,000.

The core, which contains the fissionable material serving as the reactor fuel, will require 18 months to 2 years to develop and fabricate. It will serve as a spare during early operation of the ship and will eventually replace the temporary core first used. Work is expected to begin this month at General Electric's Atomic Power Equipment Department, San Jose, California, with completion scheduled for early in 1960.

General Electric's development work is expected to lead to an improved core design for nuclear merchant ship reactors of the NS Savannah type. The company's proposal was one of seven submitted in response to a Commission invitation issued to the nuclear manufacturing industry on December 12, 1957.

A STANDOUT UNDER ANY TEST

DETROIT ROTOSTOKER C-C (Continuous Cleaning)

In any test you want to apply DETROIT ROTOSTOKER C-C *(Continuous Cleaning)* **will stand out**

Detroit RotoStoker C-C (Continuous Cleaning) with reciprocating grates that continuously clean the fire and discharge ash at the front, where it may be taken from the ash pit at floor level if desired, avoiding need for a basement ash bunker. High sustained efficiency, high availability low power for operation — For boiler capacities from 5,000 to 75,000 pounds steam per hour.

Efficiency, availability, flexibility under fluctuating load, ability to burn good or low grade coals or waste materials, durability, low parasite power consumption and low maintenance. RotoStoker C-C scores high on all points.

Among those who have tested the RotoStoker C-C — found it a winner — are such well known names as:

Allied Chemical & Dye Corporation
Alpena Power Company
American Cyanamid Company
American Radiator and Standard Sanitary Corp.
The Electric Auto-Lite Company
Automatic Electric Company
Carlisle Tire & Rubber Company
Columbian Carbon Company
Darling and Company
E. I. du Pont de Nemours and Company
General Motors Corporation
General Tire & Rubber Company
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RotoStoker C-C is typical of the Dependable Detroit Line which includes stokers for efficient firing of boilers from 3,000 to 400,000 pounds per hour steam capacity.

DETROIT STOKERS COST LESS: COST EQUALS INITIAL INVESTMENT PLUS UPKEEP PLUS PRODUCTION LOSSES DUE TO EQUIPMENT OUTAGE. THE TOTAL IS LESS WITH DETROIT.

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Recent Nuclear Developments — Cont'd

◆ The Atomic Energy Commission has given notice that it proposes to issue a permit to General Dynamics Corporation of San Diego, California, for construction of a research reactor at Torrey Pines Mesa, San Diego. General Dynamics plants to construct a heterogeneous, tank-type reactor, cooled by light water and moderated by zirconium - hydride and water. The facility will have a rated heat capacity equivalent to 10 kilowatts. Its fuel will be a homogeneous mixture of hydrided uranium-zirconium alloy containing uranium enriched to 20% in the isotope U-235. The facility will be used for training, research and isotope production.

◆ The Atomic Energy Commission has given notice of proposed issuance of a license to Curtiss-Wright Corporation for operation of a pool-type research reactor at Quehanna, Pennsylvania. A permit for construction of the reactor was issued by the Commission in May, 1957. The facility, operating at a power level of 1,000 kilowatts (heat), is to be used for an experimental program including shielding studies, reactor component and instrument development, investigation of radiation damage, neutron physics and isotope production.

◆ The Atomic Energy Commission and the Department of Defense have announced plans to build a Cobalt 60 gamma food irradiator which will become a part of the projected U. S. Army Ionizing Radiation Center at Sharpe General Depot, Lathrop, California. The gamma facility, will be used by the Army Quartermaster Corps in connection with its food preservation project, replacing the Food Irradiation Reactor (FIR) previously proposed as the gamma radiation source for the Center.

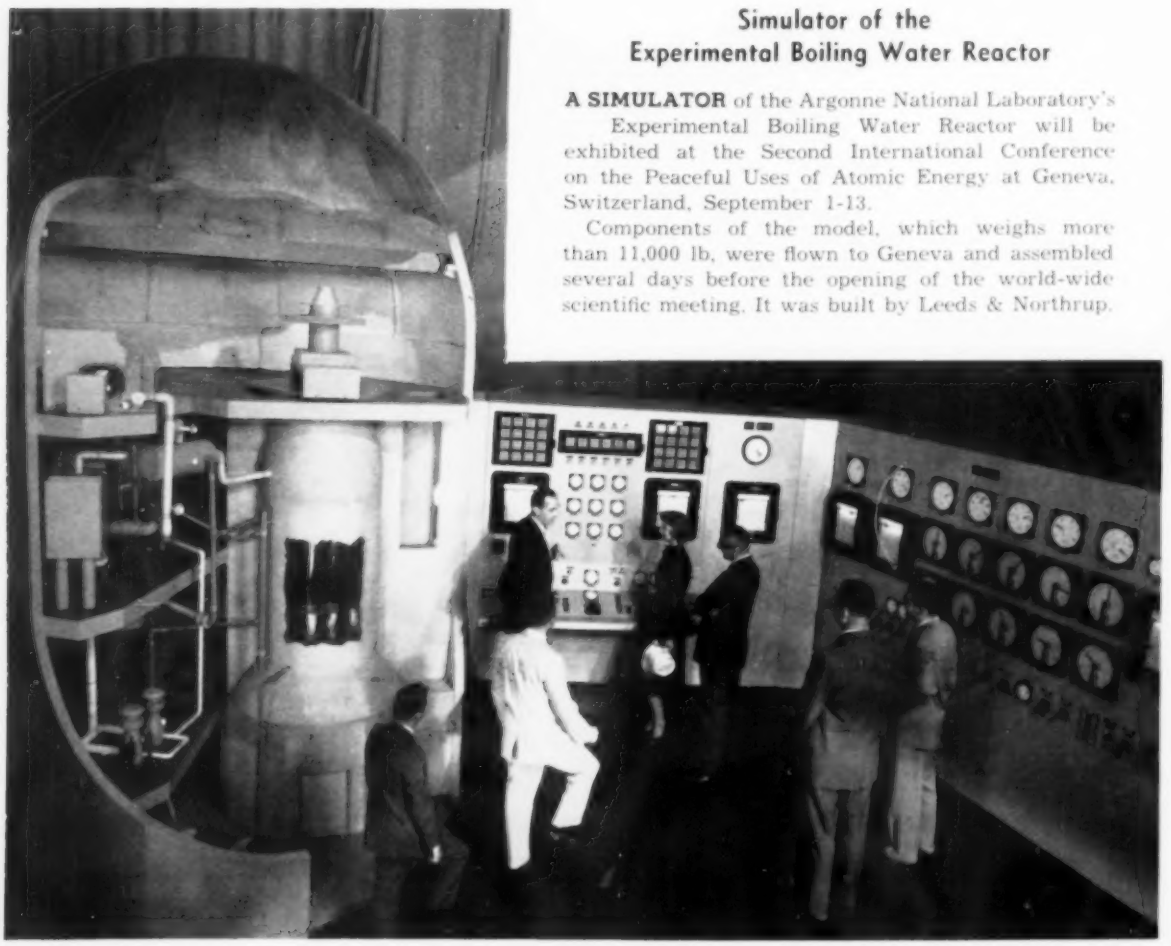
Source of radiation will be approximately two million curies of radioactive Cobalt 60. This amount of radioactive cobalt is several times greater than the quantity of Cobalt 60 now in use in the United States (approximately 350,000 curies).

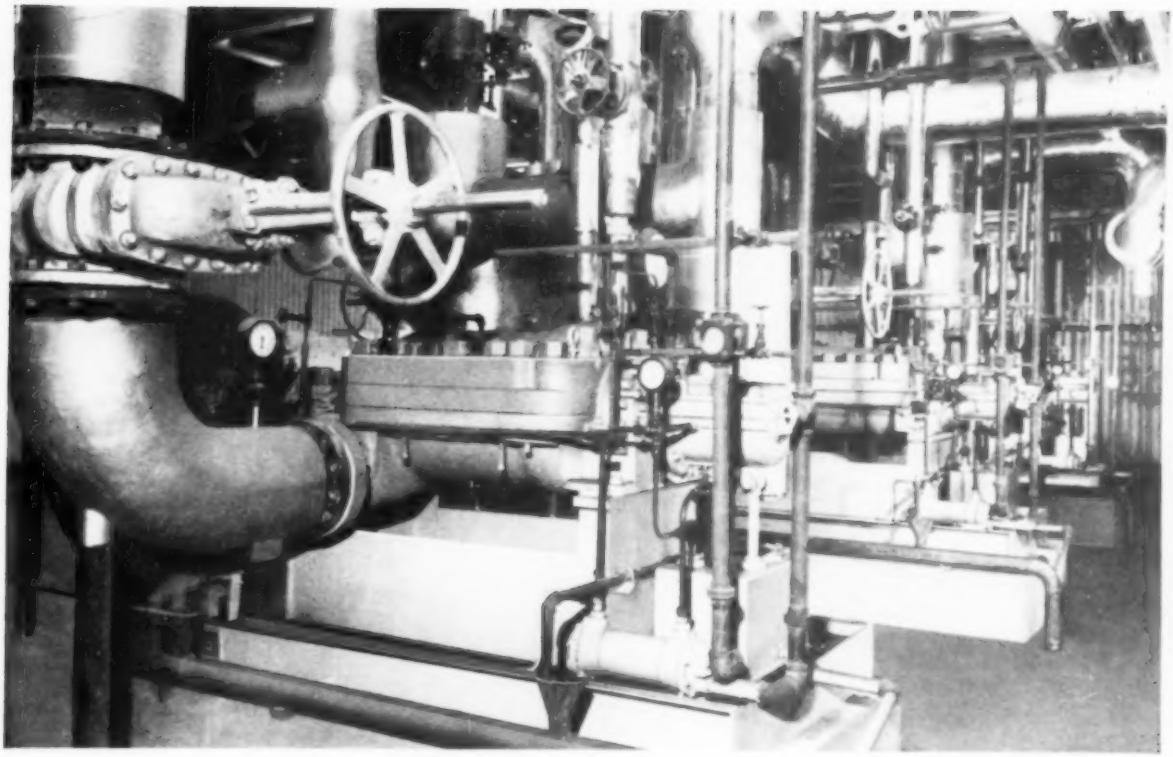
In addition to the gamma irradiator, facilities will include a versatile food processing plant capable of handling a variety of

Simulator of the Experimental Boiling Water Reactor

A SIMULATOR of the Argonne National Laboratory's Experimental Boiling Water Reactor will be exhibited at the Second International Conference on the Peaceful Uses of Atomic Energy at Geneva, Switzerland, September 1-13.

Components of the model, which weighs more than 11,000 lb, were flown to Geneva and assembled several days before the opening of the world-wide scientific meeting. It was built by Leeds & Northrup.





ST. REGIS PAPER COMPANY INSTALLS

3 MORE Ingersoll-Rand Boiler-Feed Pumps

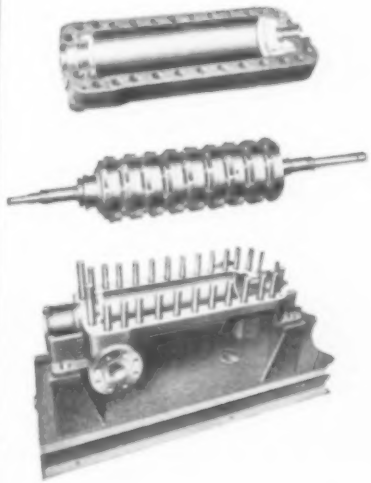
FOR JACKSONVILLE PLANT EXPANSION

WITH the new additions recently completed, the St. Regis Paper Company's Jacksonville, Fla., plant is one of the largest and most up-to-the-minute paper mills in the world.

Typical of the completely modern equipment installed throughout the plant are the three Ingersoll-Rand Class HMTA multi-stage boiler-feed pumps shown above. Each of these 5-stage units handles 1200 gallons of 312°F feedwater per minute at 875-psig discharge. Direct driven by electric motors, these pumps feature Ingersoll-Rand's distinctive Unit-Type Rotor Assembly.

Previously installed at the original Jacksonville plant were three other Class HMTA boiler-feed pumps, each rated 400 gpm, 227°F, 875-psig discharge. The new plant facilities include more than 30 other I-R units – fan pumps, stock pumps, raw water pumps and a variety of other general and special-purpose pumps.

For complete information on any pump for boiler feed and other liquid-moving jobs, just call your Ingersoll-Rand engineer.



In Ingersoll-Rand Class HMTA pumps, the shaft, impellers and stationary channel rings can be removed and replaced as a single, compact assembly without disturbing suction or discharge connections. Positive interstage sealing and multiple-volute design contribute to higher sustained efficiency, greater dependability and lower maintenance costs.

Ingersoll-Rand

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GAS & DIESEL ENGINES • VACUUM EQUIPMENT
AIR & ELECTRIC TOOLS • ROCK DRILLS

foods of interest to the Army, plus laboratories, an administrative wing, and a linear accelerator for use as a high energy electron radiation source.

Research in food irradiation has been conducted for several years under direction of the Army Quartermaster Corps in cooperation with the Department of Agriculture, the Atomic Energy Commission, other Government agencies, and more than 70 industrial and educational institutions.

Research thus far conducted has established the feasibility of using nuclear radiation, such as gamma rays and electrons, instead of heat, to kill or inactivate microorganisms responsible for food spoilage. The ultimate military and civilian advantages of the process include a reduction in refrigeration requirements, reduced food losses, improved control of some foodborne diseases, and a wider availability of fresh foods under field conditions.

◆ North American Aviation has constructed in California a solution type research reactor, moderated by light water, with a rated capacity of 10 watts (heat). The reactor uses a solution of uranyl sulfate containing uranium enriched to 20% or more in the isotope uranium-235.

The company has advised the Commission that it intends to use the reactor for demonstrating to industrial, educational and research institutions the wide variety of research and educational programs in the fields of physics, engineering, chemistry and biology which can be undertaken with a 10-watt power level reactor featuring simplicity, safety, and ease of operation.

◆ The Nation's largest and most advanced nuclear test facility — the Engineering Test Reactor — has attained full design power at the Atomic Energy Commission's National Reactor Testing Station, Idaho Falls, Idaho.

The ETR is expected to play a key role as a research tool in the development of economic nuclear power. It will be used to test the effects of intense neutron and gamma ray bombardment on the engineering components of reactors under design. Through use of the ETR, the extent of nuclear "wear and tear" that would ordinarily occur only after years of normal reactor operation can be determined in weeks or months.

The ETR's average neutron flux is 1.9 million billion neutrons per square centimeter per second. Its test spaces, measuring up to 9 x 9 x 36 in., are the largest in any test reactor now in operation for accommodating reactor components.

Training Your Fire Brigade

MOST fires start small. Except for explosions, even fires in extra hazardous locations can usually be brought under control if they are attacked with the proper "first aid" fire extinguishers *within the first two minutes.*

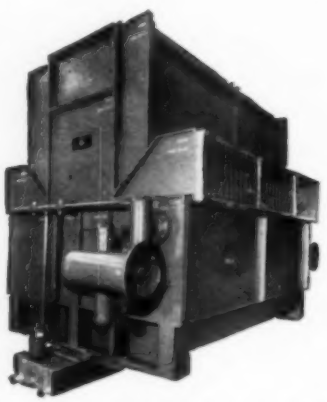
Large fires have been successfully fought by well organized company fire brigades and municipal fire departments can control almost any type of fire IF the alarm is sounded in time.

The important thing is knowing what to do — and doing it . . . fast!

Walter Kidde & Company has published a 40-page manual on "Training Your Fire Brigade to Use First Aid Extinguishers" — showing how plant management can support an effective fire brigade program and help leaders train their personnel to save lives, property and jobs. Illustrated manual reports on two essentials for plant protection, what everybody should know about fire and "first aid" extinguishers and features a chart on ABC's of Fire Protection.

Price per copy is 50 cents — write: Walter Kidde & Company, Inc., Dept. A, 675 Main St., Belleville, N. J.

ECONOMICAL COOLING OF GASES AND COMPRESSED AIR



Cooling gases or cooling and removing moisture from compressed air, the Niagara *Aero* After Cooler offers the most economical and trustworthy method. Cooling by evaporation in a closed system, it brings the gas or compressed air to a point below the ambient temperature, effectively preventing further condensation of moisture in the air lines. It is a self-contained system, independent of any large cooling water supply, solving the problems of water supply and disposal.

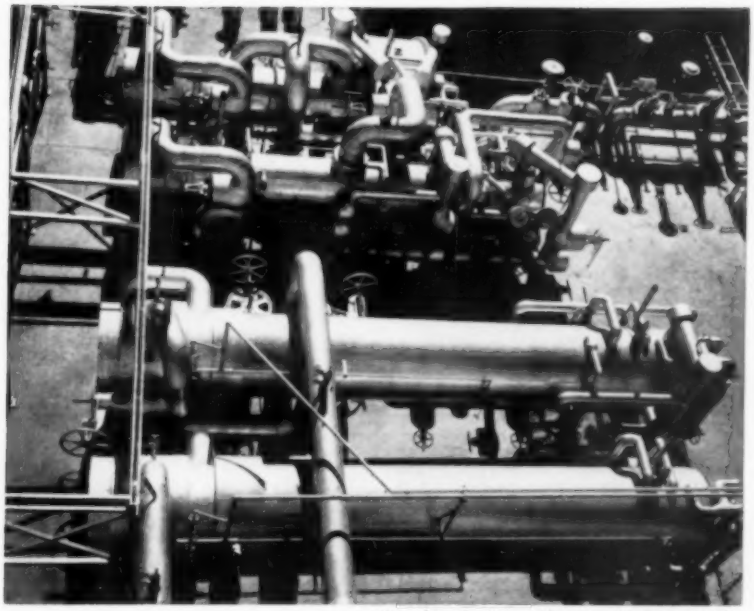
Cooling-water savings and power-cost savings in operation return your equipment costs in less than two years. New sectional design reduces the first cost, saves you much money in freight, installation labor and upkeep. Niagara *Aero* After Cooler systems have proven most successful in large plant power and process installations and in air and gas liquefaction applications.

Write for Descriptive Bulletin 130.

NIAGARA BLOWER COMPANY

Dept. SP-9, 405 Lexington Ave., New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada



Consulting Engineers, Ebasco Services Incorporated

The modern, efficient equipment shown here was designed and built by the Yuba Heat Transfer Division for the Collin Station of the Texas Power & Light Co. Serving a 110,000 KW turbine are five Yuba feedwater heaters, of which four are shown here. Two high-pressure heaters are designed for 2600 psi on the tube side with 6500 and 6750 sq. ft. of surface. Three low-pressure heaters are designed for 400 psi on the tube side and have 2850, 3165 and 4670 sq. ft. of surface.

FEEDWATER HEATERS . . . Yuba designed and built the *first* all-welded feedwater heaters, in service for the last year and a half. The weld technique was used in the tube bundles, shells and Multilok Closures. These all-weld heaters have started an industry trend.

CONDENSERS . . . Yuba is building condensers having 200,000 sq. ft. of total surface. The designs are readily adapted to condensers of even greater capacity as required for larger turbines.

EVAPORATORS . . . Yuba evaporators have achieved boiler make-up water purity of less than .2 ppm. Yuba can *guarantee* purity of .25 ppm solids content per 3000 ppm shell concentration.

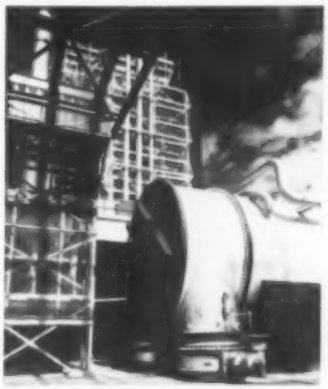
Engineering accomplishments such as these keep the power industry up-to-date. There's progress in power through progress in heat transfer equipment.

For information on Yuba power equipment contact
YUBA HEAT TRANSFER DIVISION
Honesdale, Pa.

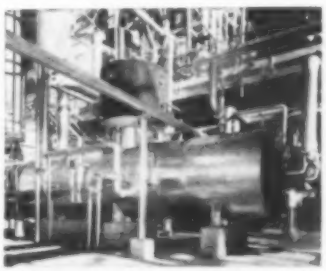
YUBA

EQUIPMENT will still be UP-TO-DATE TOMORROW

...because it's ahead today



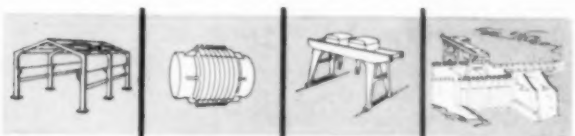
Twin-unit surface condenser has 90,000 sq. ft. of surface. Operates at 26.52 inches of vacuum with oxygen content in the condensate less than 0.01 cc per liter.



Bubble-tray evaporator produces 34,000 lb./hr. of vapor well below 1.0 ppm total solids with 3000 ppm concentration.

YUBA CONSOLIDATED INDUSTRIES, INC.

OTHER YUBA PRODUCTS FOR THE POWER INDUSTRY



Structural Fabrication | Expansion Joints | Cranes and Hoists | Hydroelectric Equipment

YUBA

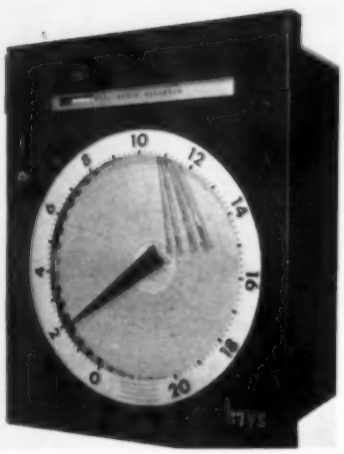
NEW Product Briefs

Universal Recorder

J-1 New electronic circular chart recorder of **The Hays Corporation,** Michigan City 34, Indiana, can record a maximum of four linear or non-linear inputs.

Recorder utilizes a cam in all its electronic receiver units, which can correct for non-linearity of input signals. This feature permits the use of the recorder with as many as four non-linear inputs. Flow, gas analysis, pH pressure, etc., can be handled on a single equally divided chart.

The new Universal Recorder gives you your choice of any four of the following records: flow, integration.



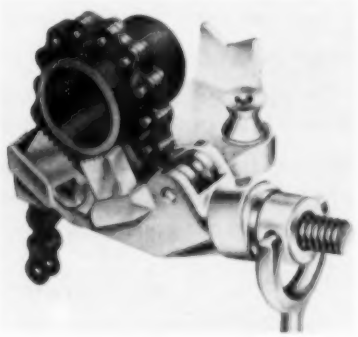
$\%0_2$, $\%CO_2$, $\%H_2$, liquid level, direct pressure, transmitted pressure, direct temperature or transmitted temperature. Design and operational features outlined in Publication 57-1190-47.

Chain Vises

J-2 A new heavy duty chain vise with faster, easier tightening features has been developed by **Erie Tool Works,** Erie, Pennsylvania.

The Pipemaster heavy duty chain vise also features a side handle which gives better leverage and, because the operator can't hit the bench, safer adjustment.

The new Pipemaster No. 1PVC has a $\frac{1}{8}$" to $2\frac{1}{2}$" capacity, while the Pipemaster No. 2PVC has a $\frac{1}{8}$" to 4" capacity. Each has reversible front and back jaws with a new, interlocking principle, giving double jaw life. An exclusive fifth jaw in the middle offers more support to avoid deforming small pipe.



Reversing or replacing the jaws is accomplished quickly and easily by loosening a single bolt which holds them firmly to the base. There is no shearing pressure on the bolt, because these double action jaws are held in position by the base.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 85

IDEAS AND PEOPLE MEET AT THE POWER SHOW, ED. I CRAM DOZENS OF CRUCIAL CONTACTS INTO MY VISIT TO THE SHOW. I SOLVE PROBLEMS, AND GET MANY NEW IDEAS FOR CUTTING COSTS IN THE PLANT.
YES, BILL. THAT'S WHY I BRING MY KEY MEN ALONG. THEY GET A NEW PERSPECTIVE ON THE INDUSTRY, AND THE FUTURE. THEY GO BACK TO THEIR JOBS RECHARGED WITH IDEAS. THEY'RE WORTH MORE TO OUR COMPANY, AND I AM TOO.
TRUNITE TUBING

You, too, will find new ways of cutting costs at the

23rd National Exposition of

Power & Mechanical Engineering

Auspices of ASME

New York Coliseum December 1—5, 1958

The Power Show is held in conjunction with the annual meeting of the American Society of Mechanical Engineers. Don't miss it! Register by mail today and save time later. No charge. Write to the Exposition at 480 Lexington Avenue, New York 17, N. Y.

Management: International Exposition Company

1245

Ventilator-Skylight

J-3 A combination skylight and roof ventilator has been developed by **Consolidated General Products, Inc.**, 24th & Nicholson Sts., Houston 8, Tex., which ventilates and at the same time illuminates the interior of a building.

The Conso roof ventilator is a lightweight plastic and steel unit that accomplishes both jobs at low initial and installation cost. A major feature is its Fiberglas-reinforced polyester plastic hood. The translucent dome passes about 2/3 of the outside light. The shatterproof plastic hood is highly resistant to atmospheric and chemical corrosion, assuring maintenance-free operation of the unit.

Conso ventilators come in 18 stock sizes, fitted with fans measuring 24" to 48" in diameter. Plastic hoods range in size from 45" to 80½" square. Complete units weigh from 127 to 335 lb and are priced from about $267.00 and up.

Conductor Identifier

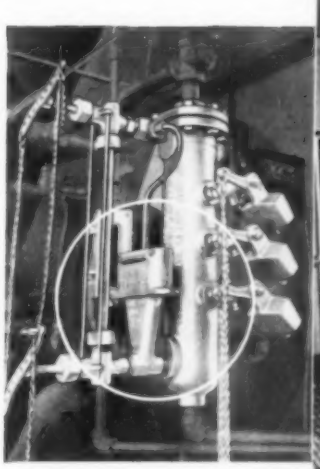
J-4 A new instrument manufactured by **J. W. Dice Co.**, Englewood, N. J., affords rapid and certain identification and separation of up to 4 unidentified conductors simultaneously.

Code signalling transmitter is attached to one end of the unidentified conductors and a common lead attached to ground. Transmitter sends out repetitive identified coded signals on each of the conductors.

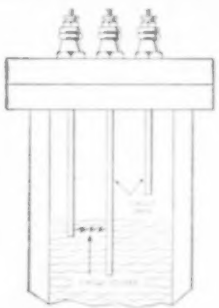
Operator then attaches a code receiving device at the distant ends of the conductors, obtaining instant identification of each.

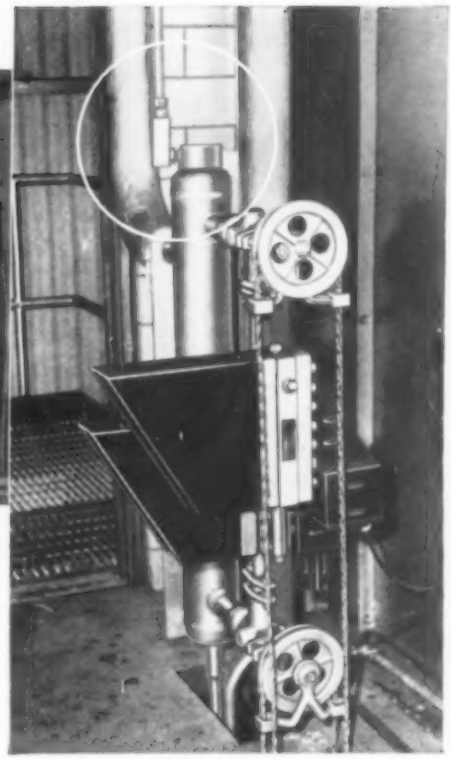
Low test signal voltage insures safety to personnel.

Weight, including carrying case and 20 ft cables, 15 lbs.



Simplest type of Levalarm, the EA15, for fuel cut-out or/and low water alarm.





The EA18 Levalarm on this water column provides high and low alarm, fuel cut-out, pump start and pump stop.

Your boiler water "calls the signals" through the Reliance LEVALARM® system

Positive, quick-acting protection for your boiler's safety

Reliance Levalarms (4 models) are designed to give you *fast action* — within a small fraction of an inch of water level variation. From one function (fuel cut-out or low water alarm) to combinations of up to *five* are available through this group of helpful signals and controls — high and low alarms, fuel cut-out, start and stop pump.

Operated by relays and isolated minute transformer-created currents that pass through the boiler water in the column, Levalarms are entirely electrical; they do not depend on vacuum tubes or magnets — have no stuffing boxes or bellows. Unaffected by pressure or temperature. Levalarms are made for every boiler pressure.

Read the full story of Reliance Levalarms in Bulletin D2. Write today.

The Reliance Gauge Column Company • 5902 Carnegie Avenue • Cleveland 3, Ohio

The name that introduced safety water columns....in 1884

Reliance®

BOILER SAFETY DEVICES

New Product Briefs (Continued)

Bulk Handling Truck

J-5 **The Prime - Mover Co.**, Muscatine, Iowa, has announced that various sizes, capacities and shapes of beds are now available for the Model M30 Prime-Mover to accommodate different materials such as sand, fertilizer, salt, coal, refuse, wet concrete, scrap, castings and heavy solid items.

It features a heavy duty truck axle, a completely enclosed hydraulic torque converter drive, and an air cooled 18 hp engine. The unit can be furnished in 42" overall width, and because of its automatic drive is extremely maneuverable and fast for shuttle service or hauling loads in close quarters and up inclines. Load capacity of the M30 Prime-Mover is 1½ tons.

Heavy-Duty Flexible Couplings

J-6 A complete line of flexible couplings, now being offered by **Lovejoy Flexible Coupling Co.**, 4899 W. Lake St., Chicago 44, Ill., in sizes to 4250 hp and over, features quick installation and easy alignment. Connection to driving and driven shafts can be made in minutes. Alignment is so simple that it can be accomplished with a straight edge. Gauges are not required.

With bore sizes ranging to 9½ in., the couplings are especially constructed for the most rugged types of service. The load is entirely transmitted through compression of individual load cushions. This not only eliminates wear on the metal jaws, thus substantially increasing coupling life, but also permits reversal or advancing of cushions on non-reversing loads to double cushion life.

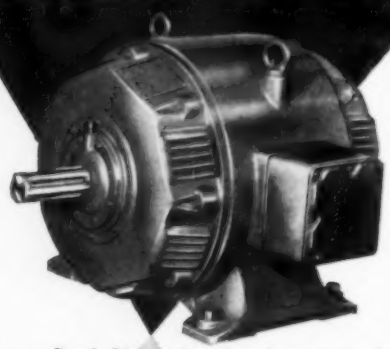
For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 85

High Pressure Filter

J-7 A new series of laminated fiber disc filters is now being offered by **Wm. W. Nugent & Co., Inc.**, 3440 Cleveland St., Skokie, Ill. The new filters, designated as 1555CP, are designed for hydraulic and other high pressure applications. They are constructed for 3000 psi working pressure to comply with the requirements of the ASME Code for Unfired Pressure Vessels.

1555CP Filters are offered in five sizes with capacities ranging from 1.5 gpm at 3 psi pressure drop to 47.6 gpm at 6 psi pressure drop when filtering 100 ssu viscosity mineral oil. For larger capacities, the filters may be connected in multiple. Inlet, outlet and drain are located in the bottom of the filter.

A 125 H.P. Brook A.C. Motor Is *NOT* *Almost* 125 H.P.



Brook Type "R". 125 H.P. Motor

When you purchase a Brook Motor of a given horsepower, that is just what you get. You need not buy 150 H.P. to make sure you get the 125 you require. Every Brook Motor has ample "copper" to deliver the particular horsepower involved — every Brook Motor is hydrostatically brake tested. You just cannot buy a better motor — yet, Brook Motors cost you up to 20% less than ordinary electric motors. Get the facts — send for literature. Standard frame & *new* NEMA Rerate frames. 1 to 600 H. P. Warehouses and Service Centers in major cities.

SINCE 1904

BROOK MOTOR CORPORATION

world's most respected motor

BROOK MOTOR CORPORATION

3553 W. PETERSON AVE., CHICAGO 45, ILLINOIS

Plug-In Steam Generating Units

J-8 Portable "plug-in" electric steam generating units by **The Electro-Steam Generator Corporation,** 2012 Duke St., Alexandria, Virginia, offer "on-the-spot" high or low pressure steam, dry and odor-free and ready for use in less than 5 minutes.

Units, ranging in size from 1/3 hp to 5 hp, produce steam at low pressure (0 to 15 lb) and high pressure (100 lb). There are no fumes, open flames, combustible fuel or fuel storage problems with these completely automatic units. Electric and water are only connections needed.

All generator units have been approved by the National Board of Boiler and Pressure Vessels under the A.S.M.E. miniature boiler code.

Air Hammer

J-9 A new air hammer which "inhales" dust and chips, providing a positive solution to dust problems in drilling concrete, brick, plaster and other masonry, has been introduced by the **Thor Power Tool Company,** Prudential Plaza, Chicago 1, Ill.

The Thor No. 15-DL dustless utility drill, sucks in drilling dust through hollow drilling steel with the dust moving out ports in the back head of the tool and into special dust-extracting tanks. It is designed for use by electrical contractors and maintenance departments of industries.

The No. 15-DL is a modification of the Thor No. 15 utility air hammer and is offered with special hollow steels and bits from ⅞ through 1¾ in.

Serving the great Barnes Hospital—Washington University Medical Center at St. Louis

FRICK Air Conditioning and Refrigeration

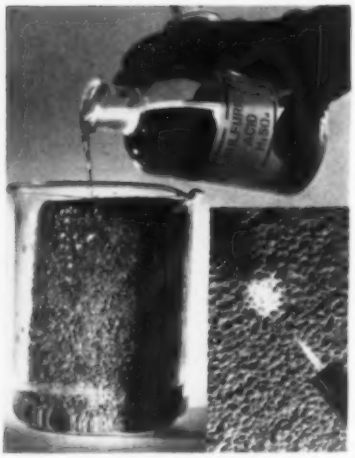
Here 11 Frick unit air conditioners and 42 Frick compressors supply the necessary cooling services for operating rooms, private rooms, auditoriums & chapel, class rooms, nurse-interns' dormitories, offices, libraries, laboratories, cafeterias, kitchens, special freezers, research departments, morgues, animal rooms, etc. Installation was made by L. V. Fleiter Co., Inc., Frick Distributors in St. Louis, Mo.

Whether you need conditioned air, cold water, ice, cold rooms or very low temperatures — for human comfort, food service, process work, quick freezing, research, or any other commercial or industrial purpose — there's a Frick system to meet your exact requirements. Let us quote now on the equipment you need. Write, wire, phone or visit . . .

7½-ton Frick unit air conditioner serving four research and lecture rooms.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U. S. A.

Three Frick "ECLIPSE" compressors which air condition several operating rooms at Barnes Hospital, St. Louis.



Foamsil is completely impervious to hot corrosive acids with the exception of hydrofluoric and hot phosphoric. When subjected to flame of an oxyacetylene torch (inset) and then water-quenched, it does not crack or spall.

Insulating Material is 99% Fused Silica

J-10 Foamsil, a new insulating material developed by **The Pittsburgh Corning Corporation**, One Gateway Center, Pittsburgh 22, Pa., offers temperature protection from as low as 450 F below zero to as high as 2200 degrees.

The new material, is 99% pure fused silica and can neither oxidize nor absorb moisture. It is unaffected by all acids, with the exception of hydrofluoric and hot phosphoric.

The material offers continuous insulating protection and withstands thermal shock within the range of —450 F to 2200 F. The insulating value of one inch of Foamsil is equivalent to that of 18 in. of acid brick at an operating temperature of 250 F.

The dimensional stability is exceptional. It does not warp, shrink or slump during rapid temperature changes. When subjected to intense heat (such as that of a steel-cutting oxyacetylene torch) and then water-quenched, it does not crack or spall.

A low expansion coefficient gives the material volume stability throughout its entire temperature operating range. For operating temperatures up to 2200 F, Foamsil actually expands whereas most insulations shrink. It has been heated in a furnace at 1600 F for more than two years without any evidence of deteioration. This feature reduces the need for expansion joints and vertical clearances, and virtually eliminates joint separation due to expansion and contraction.

Light in weight (10 to 12 lb/cu ft) and having a compressive strength of 130 to 210 psi, Foamsil can be used as a load-bearing surface to eliminate some of the supporting and reinforcing structure required with conventional material.

The material is available in block sizes — 11 in. x 17 in., 17 in. x 22 in., in thicknesses up to 3 in. Greater thicknesses may be obtained by laminating. Approximate cost of the material is 50 cents per board foot.

Industrial applications show Foamsil to be ideal as a lining inside tanks and pipe lines that contain hot acids of any concentrations. The sealed silica cells prevent absorption of the acids, inflammable solvents or vapors, thus assuring full original insulating value throughout the life of the equipment it serves. Because of the absence of capillary action, Foamsil also cannot act as a wick for transfer of inflammable liquid or gas to critical areas.

Concrete, brick or steel stacks subjected to corrosive atmospheres may be readily lined with the lightweight acid-resistant material. It can likewise be used as underground thermal and electrical insulation.

REDUCE OPERATING COST of VACUUM SYSTEMS with this "AERO" (air-cooled) VAPOR CONDENSER

With free air the cooling medium, you use the least water, evaporated in the air stream. You save the cost and pumping of large volumes of condensing water.

Air-vapor subcooling reduces mixture evacuated from the system, saving in the operation of steam ejector or vacuum pump.

This air-cooled condenser gives you more capacity than other types at a substantial saving of steam and power. Water supply, scaling treatment and disposal problems are eliminated.

You get pure condensate, an improved product; often profit by recovery of residues now wasted. There can be no contamination of your product at any time; it never touches raw water. Condensing, of water, of solvents or of your product, is simplified; you have one, compact, easily maintained unit replacing both cooling tower and barometric or surface type condenser.

Niagara Aero Vapor Condenser Panel Casing construction gives access to all parts, saves first costs in shipping and installation.

Maintenance expense is low. Niagara Aero Vapor Condenser Panel Casing construction gives access to all parts, saves first costs in shipping and installation. Summer-winter dampers and Balanced Wet Bulb Control provide precise, year 'round adjustment of capacity to load.

Constant temperature, uniform products and maximum production 12 months a year are assured. Capacities up to 15 million BTU/hr.

Write for full information. Ask for Bulletin 129R

NIAGARA BLOWER COMPANY

Dept. SP-9, 405 Lexington Ave., New York 17, N.Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

Cable Supporting Ladder

J-11 Cable supporting ladder designed primarily for the support of semi-rigid and armor jacketed cables is now available in aluminum from **T. J. Cope**

Division, Rome Cable Corp., Collegeville, Pa. This completes their plan to make their entire line available in both aluminum and steel.

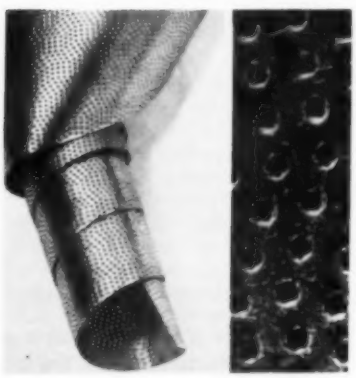
The major advantages of aluminum are its light weight, which makes it easy to install and cheaper to ship, and its additional corrosion resistance that is needed in areas subjected to corrosive chemicals.

Cable ladder offers the lowest installed cost of any type cable supporting system.

All-Steel Sandpaper

J-12 The availability for industrial use of Dragon-Skin, new flexible all-steel sandpaper, has been announced by **Red Devil Tools**, Union, N. J.

Provided in rolls 4¼" wide and up to 1600' in length, Dragon-Skin is produced by punching .036-in. diameter holes, 150 per square inch, in sheets of steel .004 in. thick.



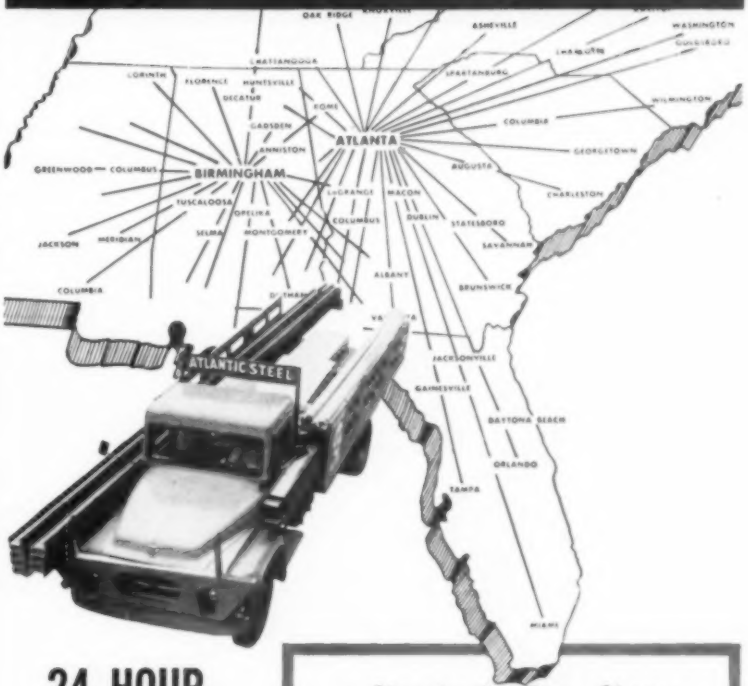
The punching process produces a five-sided burr in a uniform wave pattern. Each side simulates a wood scraper blade providing a total of 750 cutting sides per square inch. The cutting edges are so tiny that the scrapings they produce are indistinguishable from ordinary sanding or saw dust.

Comparable to medium grade conventional sandpaper, Dragon - Skin outcuts it by at least five to one and outlasts it more than ten to one without clogging. Dragon-Skin can easily and quickly rasp, sand and smooth hard and soft woods, plaster, plastics and soft metals.

Prices start at 30 cents a ft with discounts based on quantities of 100 ft or more.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 85

TWO STEEL SERVICE CENTERS TO MEET YOUR REQUIREMENTS



24 HOUR SERVICE anywhere in the South

- Structurals - Bars - Shapes Sheets - Plates
- Stainless Steels
- Aluminum Products

Atlantic Steel Service Centers in Atlanta and Birmingham are double assurance of the quickest possible deliveries throughout the South. Our own fast fleet of trucks, or reliable common carriers, get your orders of aluminum or steel where you want it, when you want it. Give us a try and find out what service *really means!*

AMERICAN STEEL WAREHOUSE ASS'N.

WAREHOUSE DIVISION

Atlantic Steel Company

ATLANTA 575 14th Street, N.W. • TRinity 5-3441

BIRMINGHAM 4230 1st Avenue South • WOrth 1-2147

ILLCO-WAY
ionXchange

soften
de-alkalize
clarify
WATER

REMOVE
organic matter
turbidity
color
iron

U. S. AIR FORCE PHOTO

HIGH-FLOW, UP-FLOW
CLARIFIER

The Clarifier shown above is part of an ILLCO-WAY ionXchange installation, at a metal-finishing plant, which is used for waste disposal and water recovery. Similar Clarifiers are widely employed to clear up surface waters used by various industries — removing organic matter, hardness, alkalinity, turbidity, color, and iron, as required by specific conditions.

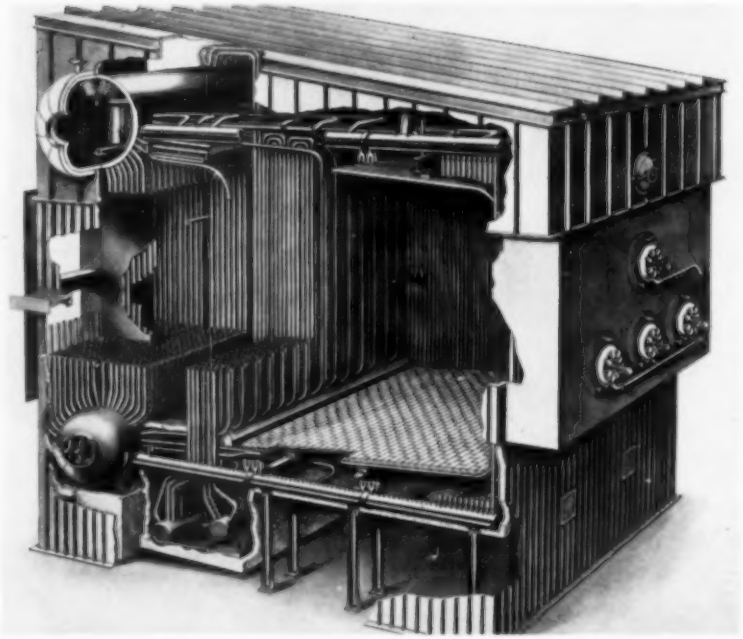
USED AS PRE-TREATMENT

In many instances it is more economical to use a Clarifier in the initial part of a system. Certain water supplies contain organic matter or turbidity which can be removed most efficiently by flocculation, or contain carbonate hardness or alkalinity which can be largely reduced by precipitation — in which situations, a Clarifier is indicated as best. *Let us analyze the water you propose to use, and advise you.*

ILLCO-WAY
ILLINOIS WATER TREATMENT CO.
840 Cedar St.
Rockford, Ill.

NEW YORK OFFICE: 141 E. 44th St., New York 17, N.Y.
CANADIAN DIST.: Pumps & Softeners, Ltd., London, Can.

New Product Briefs (Continued)



Economies With New Dual-Fuel Generator

J-13 An oil and/or gas fired, pressurized-furnace steam generator designed for power, process or heating loads requiring steam capacities up to 400,000 lb/hr has been developed by **The Babcock & Wilcox Company,** 161 E. 42nd St., New York, N. Y.

High efficiency and the elimination of the induced draft fan are accomplished through the pressurized-furnace design, with a subsequent savings in fuel, fan and power costs. Boiler operation is simplified because there is only one fan to operate and maintain, while high unit efficiency helps to keep fuel consumption at a minimum. Design also eliminates need for all internal closure refractory, thus eliminating refractory maintenance.

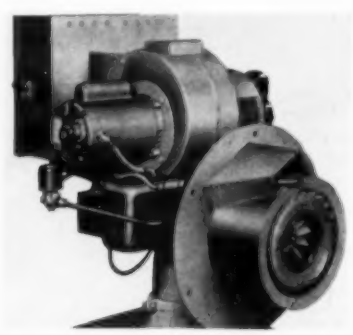
Designated the "PFI" (Power For Industry) boiler, the unit is available for steam pressures up to 1150 psi and for superheated steam temperatures up to 900 F.

Among other features are B&W's Cyclone Steam Separators. Separating the steam and water so completely that only steam-free water is recirculated, the separators produce a maximum circulating heat at all ratings, therefore protecting the boiler tubes against overheating and possible burnout.

Packaged Burner

J-14 A new series of commercial burners for forced-draft firing of gas, light oil or dual fuel in medium-size pressurized or natural draft boilers is announced by **Iron Fireman Manufacturing Company,** 3170 West 106th St., Cleveland 11, Ohio.

The company says that the completely packaged burners, named the WhirlBlast, are the first of their type on the market for medium-size in-



stallations. The burners include a new-design burner head that prevents flame pulsation, a long-time problem in gas and oil firing, especially in Scotch Marine boilers. They also eliminate the need for a costly high smokestack. Only a short stack or vent is required.

Compared with induced draft, the new forced draft system provides cleaner combustion, requires less power and operates more quietly. On models firing oil, one motor powers both the fuel pump and the draft fan.

The burner is assembled, wired and tested at the factory so that installation involves little more than bolting it to the boiler front and making the necessary service connections.

Models are available for either flange mounting or pedestal mounting. Capacity ranges from 1,200,000 to 3,600,000 Btu input for gas and 8 through 24 gph of No. 2 or lighter oil. The burner has independent ignition systems for gas and oil so that continuous operation is assured regardless of the fuel available.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 85

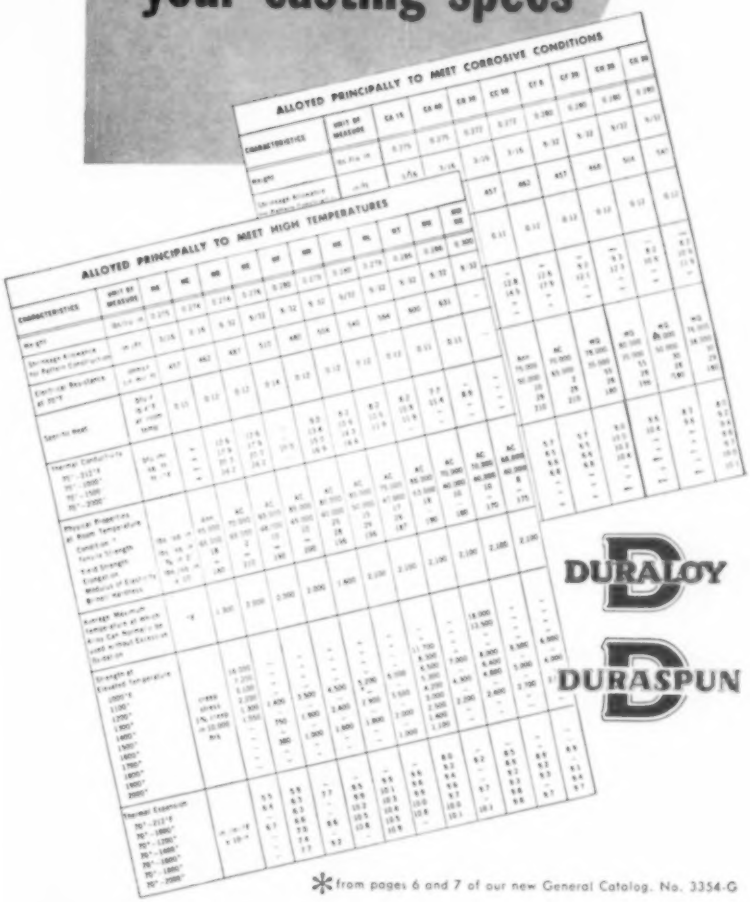
Floodlight Control

J-15 **Roth Manufacturing Company,** Dept. 178, 6420 W. Howard St., Chicago 31, Ill., has developed a new Floodlight Control No. 3158 with a photo-electric cell which is very sensitive to light and darkness. It is used to automatically turn floodlights, warning lights, etc., on when darkness approaches, regardless of the hour, and off when daylight comes or when illumination is not needed.

One of the new Roth Floodlight Controls No. 3158 can control 2,000 watts of fluorescent or neon lights, or 1,000 watts of incandescent lights. By using a power contactor it can control a bank of lights with an unlimited load. The three contact twist-lock plug in base makes it easy to install this new control onto various types of light fixtures. Other types of bases with pigtail connections are also available.

The photo-electric cell is easily adjusted to respond to various light levels between ½ to 100 foot-candles of daylight by turning the screw down cap. The light-level scale on the side of the control makes it possible to set several controls in different areas to operate at a pre-determined light level.

* TABLES to help you select the proper alloy for your casting specs



* from pages 6 and 7 of our new General Catalog. No. 3354-G

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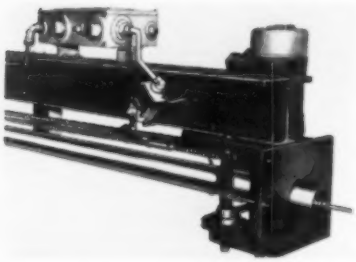
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

Temperature Probe for Boiler Start Up

J-16 A positive means of providing a continuous record of furnace temperature conditions during boiler start up is now a reality with a traversing temperature probe developed by **Copes-Vulcan Division,** Blaw-Knox Company, Erie 4, Pa.



The new device travels back and forth through critical superheater or other furnace passes to indicate or record instantaneous temperatures while registering its position to guide the operator in his firing procedure. Thus, he has a constant check on potential "hot spots" which may develop during the lighting-off period.

The probe consists of a thermocouple mounted on the end of the lance. The lance does not rotate as it traverses back and forth across the furnace area. The Chromel-Alumel thermocouple is suitable for temperatures up to 2200 F and protective tips are available for either 1600 F or the higher temperature.

For temperatures above 1000 F, the lance is air cooled. The cooling air, 250 cfm at 100 psi, is introduced into the traveling carriage from which it flows through a small annular space existing between the lance wall and a filler tube. After flowing through the lance at high velocity, the air is discharged through two nozzles mounted diametrically opposite each other 1½ feet from the end of the probe and slanted backward. Discharged air does not affect the temperature readings.

Traversing speed of the probe is 6 fpm. Lag between probe position and corresponding temperature of the thermocouple is approximately one second. If a multiple point temperature recorder is used, an additional delay would be introduced depending upon the number of print positions incorporated. Actual temperature values registered by the probe are within 10 degrees of readings taken from test thermocouples mounted within the furnace pass traversed by the probe.

Control of the driving motor is such that the probe can be stopped at any point along its path, or it will automatically traverse back and forth until stopped.

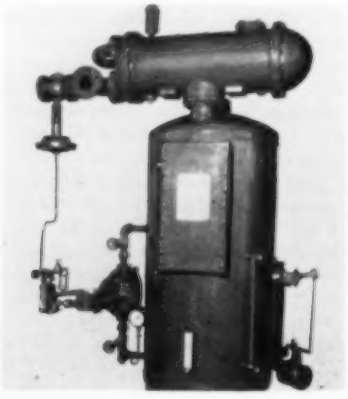
The complete probe, in lengths up to 30 ft, comes fully equipped with electric drive motor, special alloy lance, furnace wall sleeve, air hose reel, potentiometer, thermocouple and lead wire, reversing starter, control station, relays, and limit switches.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 85

Liquid Level Control

J-17 Very accurate control of water admitted to feedwater heaters is possible with a new pilot operated liquid level control manufactured by **Stickles Steam Specialties Co.,** 2215 Valley Ave., Indianapolis 18, Ind.

While float controls normally used on feedwater heaters permit fluctuations of water level in the storage section up to 12", the new control maintains any desired level within 2" - 1", plus or minus the setting.



The control consists of exterior float, pneumatic pilot, and diaphragm motor valve. Slightest float movement causes the pilot to apply or release pressure on the diaphragm motor valve to open or close the feedwater inlet.

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FUTURE EVENTS of Engineering Interest

Sept. 3-5: First National Conference on the Application of Electrical Insulation. AIEE and NEMA, Pick-Carter & Statler-Hilton Hotels, Cleveland, Ohio. T. F. Hart, Chm., Pub. Committee, c/o Silicones Div., Union Carbide Corp., 30 East 42nd St., New York 17, N. Y.

Sept. 15-17: American Institute of Electrical Engineers. Petroleum Industry Conference, Baker Hotel, Dallas, Tex.

Sept. 15-17: Process Industries Conference. American Society of Mechanical Engineers, Statler Hotel, Buffalo, New York.

Sept. 18-21: 40th Annual Meeting. Public Utilities Association of the Virginias, Greenbrier Hotel, White Sulphur Springs, W. Va. R. W. McKinnon, Exec. Secy., PUAV, 602 First Federal Bldg., Roanoke, Va.

Sept. 28-Oct. 1: Power Conference. American Society of Mechanical Engineers, Statler Hotel, Boston, Mass.

Sept. 29-Oct. 3: American Society of Tool Engineers. Semi-Annual Meeting & Western Tool Show, Shrine Exposition Hall, Los Angeles, Calif.

Oct. 6-10: Southern Textile Exposition: Textile Hall Corp.; Textile Hall, Greenville, S. C. H. H. Lesesne, 434 Palmetto State Life Bldg., Columbia 1, S. C.

Oct. 9-10: 21st Annual Joint Solid Fuels Conference. ASME-AIME, Hotel Chamberlin, Old Point Comfort, Va. Carl S. Dennis, Chm., Va. Section, ASME, The Chesapeake & Ohio Railroad Co., Richmond, Va.

Oct. 13-15: National Electronics Conference. 14th Annual Forum on Electronic Research, Development, and Application, Hotel Sherman, Chicago, Ill. Arthur H. Streich, Gen. Mgr., NEC, Inc., 84 East Randolph St., Chicago 1, Ill.

Oct. 14-16: 13th Annual Exposition. Society of Industrial Packaging & Materials Handling Engineers, Coliseum & Morrison Hotel, Chicago, Ill. G. Cornwall Spencer, 327 S. LaSalle St., Chicago 4, Ill.

Oct. 20-21: Southeastern Electric Exchange. Engineering & Operation Section, Hotel Roanoke, Roanoke, Va.

Oct. 20-24: South Central Region Annual Conference & Exhibition. National Association of Corrosion Engineers, Roosevelt Hotel, New Orleans.

Oct. 23-25: Mid-America Minerals Conference. American Institute of Mining, Metallurgical, and Petroleum Engineers, Chase & Park Plaza Hotels, St. Louis, Mo. Society of Mining Engineers of AIME, 29 West 39th St., New York 18, N. Y.

Oct. 27-31: 40th Annual National Metal Exposition & Congress. American Society for Metals, Public Auditorium, Cleveland, Ohio. ASM, 7301 Euclid Ave., Cleveland 3, Ohio.

Nov. 20-21: Electronic Computation Conference. American Society of Civil Engineers, Kansas City, Mo. ASCE, 33 West 39th St., New York 18, N. Y.

Dec. 1-3: Semi-Annual Meeting. American Society of Refrigerating Engineers, Hotel Roosevelt, New Orleans, La.

Dec. 1-5: 23rd National Exposition of Power & Mechanical Engineering. American Society of Mechanical Engineers, New York Coliseum, New York, N. Y. E. K. Stevens, Pres., International Exposition Co., 480 Lexington Ave., New York 17, N. Y.

For technical program highlights of the **ASME-AIME Solid Fuels Conf.**, Oct. 9-10, Old Point Comfort, Va., see page 28.

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NEW Catalogs & Bulletins

STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

1—Package Boiler — New compact, low cost package unit (oil or gas fired) for small space requirements is described in Bulletin DK-1. Pressures to 325 psi, steam capacities to 45,000 lb/hr.—E. KEELER CO.

5—Refractories — Paco High Heat Duty and Super Duty Plastic Refractories. Fire brick, high temperature cement, castables. Installation and engineering service. Free estimates and inspection. — NORTH STATE PYROPHYLLITE CO.

8—Steam-Turbine Units — Medium condensing turbines utilizing either non-reheat or reheat; non-condensing turbines; single, double and triple automatic extraction turbines; admission units; and admission-extraction steam turbines for utilities and process industries described in Bulletin GEA-3277D. — GENERAL ELECTRIC.

10—Stokers—Application & operation of A.E. Types "H" & "R" and Vibra-Grate stokers described in latest bulletins. Latter burns low grade fuels without smoke. No dust collectors necessary. — AMERICAN ENGINEERING CO.

19—Feed Water Deoxygenation—12 page Bulletin BW-7 describes advantages of chemical deoxygenation of boiler feed water with an aqueous solution of Hydrazine. Covers in detail the properties and action of Hydrazine in maintaining boilers as well as recommended methods of application. — FAIRMOUNT CHEMICAL CO., INC.

30—Coal Plant Specifications — 64 page brochure, including 5 drawings, is a comprehensive guide for preparing specifications on coal-fired low-pressure heating plants in the size range of 750,000 to 5,500,000 Btu/hr. All aspects affected by choice of fuels from storage bin to stack design covered fully. — BITUMINOUS COAL INSTITUTE.

43—Soot Blowing Systems — 4 p Bulletin 1015A describes Pneu-Blast system for installations where steam available is at too low a pressure, or where air compressor capacity is less than would be required with other methods of air blowing. Diagrams explain how pressure indexing controls system according to compressor capacity. — COPES-VULCAN DIV.

50—Coal Crushers — Catalog 784-C describes single and double roll crushers, swing hammer pulverizers for all sizes of plants.—JEFFREY MANUFACTURING COMPANY.

70—Seamless Boiler Tubes—44 page Bulletin 12 contains complete description of manufacture, advantages, tolerances, allowable stress and working pressures, bursting strength, weights, steam properties, and other data.—National Tube Div., UNITED STATES STEEL CORP.

74—Packaged Generator — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel systems. — TEXSTEAM CORP.

78—Packaged Firing Units — Bulletin 28 illustrates and describes the Series 20 Steam Atomizing Packaged Firing Units for oil and/or gas fuels. Includes specifications and dimensions. — NATIONAL AIROIL BURNER CO., INC.

87—Steam Turbines—Single Stage—Bulletin 500 describes features and characteristics of company's type DH steam turbines in horizontal and vertical models. — DEAN HILL PUMP COMPANY, INC.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

100—Power Plant Pumps — Bulletin BJP58-8 covers complete line of standard pumps for all power plant requirements — from 12,000 hp, double-case boiler feed pump, to condensate circulating and booster pumping duty. Also, special pumps for nuclear power plant installation. — BYRON JACKSON PUMPS, INC.

102 — Teflon Gear Pump — Bulletin describes self-priming rotary gear pump suitable for non-lubricating and corrosive fluids. Suitable for speeds to 1750 rpm at capacities to 10 gpm & pressures to 100 psi. — ECO ENGINEERING CO.

104—Fans—Bulletins F-102 & F-200 describe Type "BL" and "BLH" fans offering high stability and efficiency for all classes of ventilation. Type "BLH" designed for high, broad efficiency curve on higher pressure jobs (6¾" water gauge and up). — BUFFALO FORGE COMPANY.

107—Proportioning Pump—4 p brochure illustrates and describes company's proportioning pumps and package chemical feeding units. Includes applications and specifications.—BIRD ARCHER CO.

116—Air & Gas Compressors—Form 3132-A shows complete range of centrifugal and reciprocating units in process and chemical industries — for all pressures from deep vacuum up to 35,000 psi and capacities up to 165,000 cfm.—INGERSOLL-RAND COMPANY.

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128—How to Solve Pumping Problems—Booklet, 36 pages — Explains the functions and characteristics of Rotary gear pumps; sample application problems with charts and curves on pipe friction losses; viscosity conversion tables, materials of construction for various liquids, and additional information pertaining to pump applications. — ROPER HYDRAULICS, INC.

134 — Mechanical Draft Service — "CR" radial wheel draft fans for stoker fired or pulverized coal boilers described in Bul. FD 205. Also handles air with dust loadings in wide range of industrial jobs. — BUFFALO FORGE COMPANY.

137 — Volute Pumps — 6 p Catalog F-102 describes low and high head mixed flow volute pumps for sewage disposal, drainage, flood control, etc. Presents design details. Units built in 12" through 72" sizes, and in 3000 to 150,000 gpm capacities. Heads up to 180 ft. — C. H. WHEELER MFG. CO.

160—Boiler Feed Pumps—12 p Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included.—PACIFIC PUMPS, INC.

189—Air Traps — Bulletin 289 describes ball float traps for draining water from air, gas or steam lines, or for draining light liquids from gas under pressure. Physical and selection data, prices, etc. — ARMSTRONG MACHINE WORKS.

INSTRUMENTS—METERS CONTROLS—REGULATORS

204—Floatless Level Control — Data sheets PC-37 describe control that is unaffected by surface agitation and equipment vibration. Simple, compact, one adjustment unit.—LESLIE CO.

209—Liquid Level Controls—Catalog describes controls for almost any liquid, at any pressure, at any temperature. Can be furnished in top-mounting, side-mounting styles, or as external float cage units. Almost unlimited application. — MAGNETROL, INC.

213—Meters & Controls — Bulletin G15-1 describes and illustrates systems and instruments used in the measuring, transmitting, receiving, interpreting and controlling of 18 variables normally encountered in power plant and industrial plant operation. — BAILEY METER COMPANY.

231 — Control Valves — Catalog No. 305 illustrates and describes construction and specifications for a wide line of air operated diaphragm control valves suitable for the majority of general process applications and plant services. — MASON-NEILAN.

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235 — Liquid Levels — Bulletin 532 describes indicator which gives a reliable, automatic reading of storage tank contents. 20" dial in 3 x 10" case saves panel space. No outside power source needed; can be located up to 250 ft from tank. — THE LIQUIDOMETER CORP.

252—Water Columns, Gages, Equipment — Brochure AO — Introduction to low pressure (0 to 250 psi) division of catalog data. Explains principles and construction of Reliance low pressure alarm water columns, and lists accessory equipment. — RELIANCE GAUGE COLUMN CO.

254 — Pilot Pressure Controller — Bulletin D-4 — Describes the dependable Wizard pilot, Series 4100 U, in a new gas type weatherproof case for flush or surface panel mounting, available with either bellows or Bourdon tube measuring elements for pressures from inches of water to 10,000 psi. — FISHER GOVERNOR CO.

286—Feedwater Regulator — Bulletin 1055 describes the Flowmatic Type P feedwater regulator, applicable for marine or stationary service. Gives mechanical description of components and schematic diagram showing suggested piping arrangement. Also specification table. — COPES-VULCAN DIV.

287—Color-Port Water Gage — Bulletin WG-1814 describes the new gage for high pressure boilers (up to 3300 psi). Gives full details on design and operation and shows how it gives greater visibility and greatly reduced maintenance requirements. —YARNALL-WARING COMPANY.

PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

300—Fact Folders — 23 up-to-date industrial fact-file folders on aluminum, steel, copper, stainless steel, insulation, roofing and other industrial supplies immediately available from 9 Southern warehouses. — REYNOLDS ALUMINUM SUPPLY CO.

303—Stacks & Breechings — Form 75 describes monolithic linings for full protection of stacks and breechings, utilizing castable refractories. Typical installations illustrated and described. — PLIBRICO CO.

306 — Steel Buildings — Shed roof, gable roof frameless and gable roof rigid frame units described in Catalog SX-13757. 5,000 sizes available to meet all space needs. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

307—Condensate Drainage Control— Publication 6025 describes units for improving quality of heat transfer in process equipment through continuous return of condensate to boiler at high temperature and pressure. Lists many cases substantiating claim for increased heat transfer, more production with less fuel. — COCHRANE CORPORATION.

310—Incinerator — Metal cased, insulated, refractory lined incinerators for industrial and commercial use. City smoke code approved. Fast, economical installation — any size and capacity. — NORTH STATE PYROPHYLLITE CO.

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311—Circulating Unit — Illustrated Bulletin 484 describes the CircOilator, a circulating unit for maintaining controlled volume and pressure of oil for stuffing boxes. System includes 18-gallon tank, pump, motor, pressure regulator, filter, tank breather and relief valve. — DURAMETALLIC CORP.

315—Pressure Vessels — Catalog 100 discusses your plate fabrication problems and shows how company custom-fabricates hot water storage heaters, tanks, air receivers, blow-off tanks, etc. Corrosion resistant linings and materials featured. Suggested specifications and other valuable technical data given. — J. J. FINNIGAN CO.

317—Drier Compressed Air—Bulletin 130 shows how Aero After Cooler cools compressed air or gas below temperature of surrounding atmosphere; no further condensation in your air lines. Installed outdoors. Saves cooling water. Gives better operation of air-operated tools, etc. —NIAGARA BLOWER COMPANY.

323 — Mercury Vapor Fixture — Industrial color corrected units described in Bulletin 401. "Stabilux Socket" secures bulb end of lamp, eliminating lamp rupture and breakage from vibration. — WIDE-LITE CORP.

331—Storage Bins — Bulletin illustrates and describes Super-Concrete storage bins for industry. Lists of prominent users and varieties of materials are given. Contains tables of capacities and photographs of typical installations—NEFF & FRY.

338—4-D Wrought Iron — 8 p booklet discusses 4-D Wrought Iron which is 25% more corrosive resistant than standard wrought iron. Illustrated test section, applications and service conditions included. — A. M. BYERS CO.

377—Track Switch Materials — Catalog 575A points out time and money savings through single-source buying of track materials and supplies. Offers information on frogs, switches, crossings, etc. — L. B. FOSTER CO.

PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

402—Forged Steel Valves — General Purpose Valves, Supplement No. 1 to Catalog F-9, covers gate, globe and angle valves. ½" thru 2" sizes, and 150-800 pound service. Featuring 13% chrome stainless steel trim with hard facings. — HENRY VOGT MACHINE CO.

403—Valve Operators—Folder shows how re-designed sprocket rim makes any valve readily accessible from the floor. Simplifies pipe layouts, prevents accidents, fits all valve wheels. — BABBITT STEAM SPECIALTY CO.

407—Piping Materials — Bulletin reports on intensive investigation into problem of main steam piping materials and gives data on stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. — PITTSBURGH PIPING AND EQUIPMENT COMPANY.

408 — Wide-Range Valves — Data Sheet 10-5 covers the "Point 4 Factor Trim" — answer to those few types of applications where reduced capacity trim is desirable. Available in V-port and solid turned designs for double or single seated valves and in wide variety of material. — MASON-NEILAN DIV.

425 — Steam Trap with only three parts — cap, disc and body described in Bulletin 257. No valve closing mechanisms. Only moving part is solid stainless steel disc. Same trap for all loads and pressure 10-600 psi. — SARCO COMPANY, INC.

427 — Diaphragm Valves — Valves for common and corrosive services described in Circular AD-1942. Have independent seating and bonnet sealing. — CRANE CO.

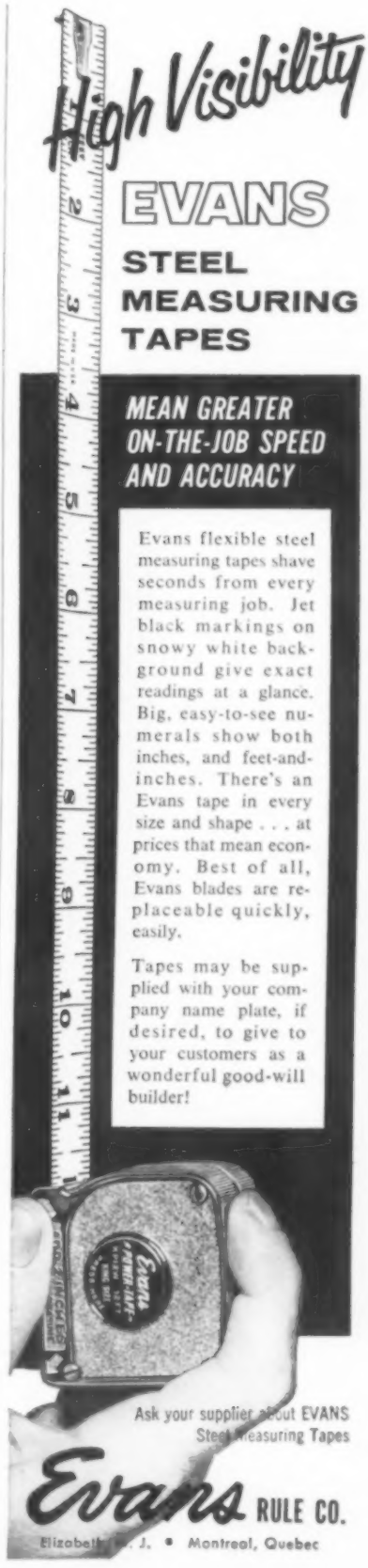
430 — Check Valves — Catalog 30A highlights the "tilting disc" check valve for handling fluids or gases under wide range of pressures. — THE CHAPMAN VALVE MFG. CO.

443—PVC Fittings & Flanges—Corrosion resistant polyvinyl chloride pipe fittings & flanges covered in 12 p catalog, featuring characteristics, advantages, limitations, operating pressures, temperatures, field tests, etc.—GRINNELL COMPANY, INC.

451—Aluminum Jacketing & Elbows — Folder J-1 describes aluminum protection for insulated lines, elbows, towers, vessels and tanks. Jacketing in 5 thicknesses, 2 alloys. Ell-Jacs in 60 sizes both for 90° and 45° ells. — CHILDERS MANUFACTURING CO.

456—High Alloy Castings & Pipe—Bulletin 3354G explains how static and centrifugal casting & pipe offer maximum resistance to heat and corrosion. — THE DURALOY COMPANY.

484—Threading Wrought Iron Pipe—A service manual which discusses in detail the proper threading of wrought iron pipe, both from the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Bulletins (Cont'd)

theoretical and practical standpoints. Illustrated with many helpful views. — A. M. BYERS COMPANY.

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501 — Neoprene Rubber-Coating — Charcote, a waterproof protective barrier against rust and corrosion described in 4 p bulletin. Offers plant engineer outstanding protection against corrosive fumes, salt spray, abrasion and moisture. — CHARLESTON RUBBER CO.

502—Hazardous Liquid Gasket Material — How type 662 gaskets can stand varying climatic conditions without drying, shrinking, or hardening described in Bulletin AD-146. For use against gasoline, water and oil at temperatures up to 300 F. Has Underwriters' Laboratories, Inc. approval. — THE GARLOCK PACKING COMPANY.

505—Metal Cutters — Bulletin 655 shows actual cost figures on various metal cutting jobs (bolt, rod, wire, chain, etc.), by using cutters, hand and power-operated cutters.—H. K. PORTER INC.

506 — Gage Glass Cleaning Tool — Data sheet No. 301 describes tool which uses brushes to quickly and efficiently clean inside of liquid level gage glass.—JERGUSON GAGE & VALVE CO.

513—Conveyor Belt Repairs — Bulletin R-700 and Folder R-4 describe the "Rema" method of making vulcanized repairs without heat. Holes, gouges, rips and tears can be repaired on the job. Curing time delay is eliminated. Belts can be put into service immediately after repair is made.—FLEXIBLE STEEL LACING COMPANY.

530—Electric Stud Heaters—Bulletin L-1244 illustrates and describes how Electric Stud Heaters give faster and more accurate shrink-tightening of large studs and holding bolts. Contains procedure for use and table of heater sizes, ratings and prices.—EDWIN L. WIEGAND CO.

531 — Stack Maintenance — How wrought iron offers unique defense against flue gas corrosion described in bulletin "Wrought Iron for Flue Gas Conductors."—A. M. BYERS COMPANY.

533—Air Compressor Rod Packing—Catalog 56 shows how "Compressor" No. 760 stays flexible under intense dry heat and protects rods from premature wear.—THE BELMONT PACKING & RUBBER CO.

564 — Anti-Corrosive Paints — Bulletin, "The Application of Subox and Subalox Paints" — Gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application.—SUBOX, INC.

ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

600 — Conveyor Idlers — Bulletin SI-116 describes pre-lubricated "UST" Conveyor Idlers. Incorporating Timken bearings and Garlock Klozures, construction permits operating without lubrication for 1-3 years or more. — CONTINENTAL GIN COMPANY.

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609—Automatic Control of Materials by Weight — 6 p Bulletin 0557 discusses how the Select-O-Weigh System provides complete automation in continuous or batch processing operations, including record keeping. — RICHARDSON SCALE CO.

610—Flexible Couplings — All metal couplings described in Catalog 51A have no wearing parts; offer freedom from backlash, torsional rigidity; free end float; smooth continuous drive; and visual inspection in operation. — THOMAS FLEXIBLE COUPLING CO.

629 — Longer V-Belt Life — 12 page Bulletin 20x6234C describes various types of V-belts and tells how to select and match them. Lists seven steps for correct installation and hints for making them last longer. — ALLIS - CHALMERS MFG. CO.

631—Screw Conveyors—Catalog ID-541, 68 pages — Illustrates and describes standard and special types of conveyors, with engineering data necessary for selection. Tables give sizes, types, speeds, horsepowers and other information. Accessories included. — CONTINENTAL GIN COMPANY.

639—Diesel Engines — 16 p Catalog BU-413 describes two new diesel engines — Model D-344 and D-516. Includes photographs, cutaways, charts and other illustrations. — ALLIS-CHALMERS MFG. CO.

WATER TREATMENT, HEATING VENTILATING, AIR CONDITIONING REFRIGERATION, DUST & FUME CONTROL

701—Exhausting Corrosive Fumes—Bulletin 702-A shows how corrosive fumes can be exhausted with rubber, lead lined or specially coated fans. — CLARAGE FAN CO.

706—Automatic Roof Cooling—Bulletin shows how automatic evaporative roof cooling can reduce inside temperature 8 to 15° without air conditioning; increase roof life; and reduce fire hazards. Many Southern installations. — APRIL SHOWERS — SOUTHERN.

708—Zeolite Softener — 8 p Bulletin 4530-A discusses the hydrogen zeolite process — its advantages, chemistry and neutralizing variations. — COCHRANE CORP.

715 — Amine Treatment — Return line corrosion is a critical problem in maintaining economical, efficient power plant operation. Bulletin CP-100 shows how amine treatment is an easy, effective and economical way to eliminate pipe corrosion problems. — THE BIRD ARCHER COMPANY.

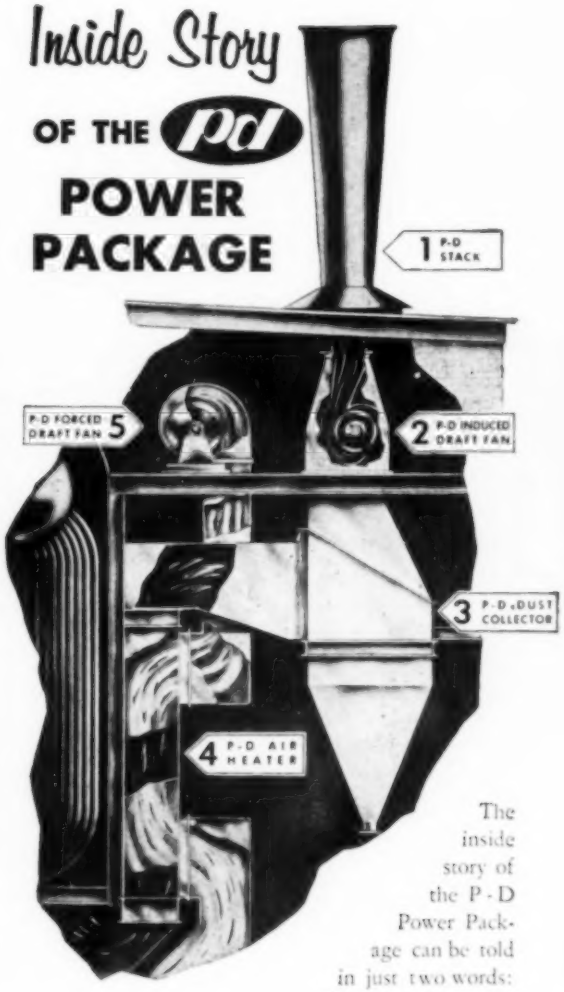
716 — Dust Collection — Whether nuisance elimination or process material recovery, check on Whirlex Dust Collector Units. Engineering data available. — THE FLY ASH ARRESTOR CORP.

723—Dust Collection — Catalog describes mechanical and electrical systems which meet most rigid anti-air-pollution codes; low resistance fly ash collector which combines top efficiency with low draft loss for natural or forced draft installations. — BUELL ENGINEERING COMPANY.

739—Air Engineering — 8 p Bulletin 135 illustrates and describes air engineering apparatus for process industries. Includes after-coolers, air conditioners, liquid coolers, heat exchangers, condensers, refrigeration equipment. — NIAGARA BLOWER CO.

755 — Cooling Tower — Bulletin DVAQ describes the double-flow Aquatower for industrial services involving intermediate-gallonages. Space saving line in wood or steel structure with asbestos cement board casing, in single or multi-cell units. — THE MARLEY COMPANY.

Inside Story OF THE pd POWER PACKAGE



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Bulletins (Cont'd)

764—Cooling Equipment — Bulletin 80-D describes company's complete line of commercial and industrial equipment—operating principles, design features, etc.—FRICK CO.

ELECTRICAL

805—Power Factor Correction — 24 page catalog 50B shows how you can cut power costs by installing correction capacitors on motors and other inductive electrical equipment. Greater loads can be handled from existing circuits. Wiring, transformer and switchgear costs can be greatly minimized in new installations.—SPRAGUE ELECTRIC CO.

811—Electric Heat — "100 Ways to Apply Electric Heat" gives a wealth of informative data on the use of electric heat in industry — fast, uniform, dependable, backed by nationwide engineering service. — EDWIN L. WIEGAND CO.

825 — Weather-Protected Motors — Bulletin 51B8606A describes features which contribute to outdoor dependability of company's weather-protected motors (Type FOD) in ratings from 250 to 900 hp. — ALLIS-CHALMERS MFG. CO.

841—Applying Electric Heat — "101 Ways to Apply Electric Heat"—Gives illustrated case histories showing experience-tested methods of applying Chromalox electric heating elements. Physical aspects of installation are shown along with the description of the problem, solution and advantages obtained.—EDWIN L. WIEGAND CO.

842 — Circuit Protection — Bulletin FIS describes the maintenance free Fusetron fuses which protect motors, solenoids, coils and transformers against burnout, and which increase production by eliminating needless blows.—BUSSMANN MFG. CO.

855—Wiring Analyzer — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules.—SPRAGUE ELECTRIC COMPANY.

862—Motor Starters — Manual, auto-transformer type recommended where characteristics of driven load or power company rules require reduced voltage starting. Details in Bulletin 646. — ALLEN-BRADLEY.

884—Portable Cords — Bulletin covers complete new line — Securityflex cords for severest applications; Industrial "all-purpose" cords for hard usage; and Service cords for shop appliances. — ANACONDA WIRE & CABLE COMPANY.

OPERATING AIDS SUPPLIES & MISCL.

906—Steel Measuring Tapes — Complete catalog describes full line of measuring tapes from 6 to 100 ft, including wide blade tape with upright measurements. — EVANS RULE CO.

911—Rescue Kit — Bulletin 733 describes unit and procedure for freeing persons trapped in cars, buildings, under machines, in elevators, etc. — H. K. PORTER INC.

912—Visual Control — 24 page Booklet BH-10 describes how the Boardmaster Visual Control can help you get things done better and faster.—GRAPHIC SYSTEMS.

General Electric Continues Southern Expansion

Last month General Electric located a new television picture tube plant in **Augusta, Georgia** and has recently announced the purchase of a 40,000 sq ft switchgear plant in **Chamblee, Georgia.**

Since World War II, General Electric has established 24 plants in 11 Southern states to manufacture a wide variety of hard goods products. These plants represent a total investment of more than $325 million and an annual payroll of more than $150 million.

Latest expansion, launched a year ago as a small pilot operation in the G-E Apparatus Service Shop in Chamblee, Georgia will employ 70 in the assembly of control devices, relays, instruments and meters into switchboards for the control and protection of electrical apparatus.

The Switchgear operation brings to more than 800 the number of G-E employees in the Atlanta area. In addition to the Apparatus Service Shop, the Company maintains sales and service facilities for nearly 30 different components in Atlanta.

In July, G-E announced the location of a television picture tube plant in Augusta, Georgia, which will employ about 70 persons. The Company operates a medium transformer plant in Rome, Ga., employing about 1400 persons.

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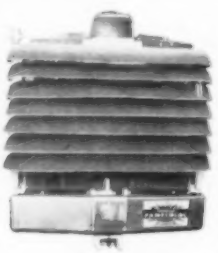

Thermobloc Division
PRAT-DANIEL CORP.
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Southern News Briefs — Continued from Page 32

C. W. Mills and P. T. Lagrone

New Orleans Dist. Office for Westinghouse Elec.

Westinghouse Electric Corporation has increased the responsibilities of its **New Orleans** apparatus sales organization, raising it from a branch office of the southeastern region to a district office. The southeastern region with headquarters in Atlanta now has four district offices — Atlanta, Birmingham, Charlotte, N. C., and New Orleans.

P. T. Lagrone, formerly manager of the company's electric utility sales department, has been named manager of the new office. **J. H. Bennett**, former branch office manager, becomes assistant district manager in the new organization.

C. W. Mills has been named manager of the electric utility sales department succeeding Mr. Lagrone.

I-T-E Opens New Southern Offices

The I-T-E Circuit Breaker Company has recently opened new district offices in Florida and South Carolina.

H. Lee Hamilton, formerly district manager of the Company's Washington, D. C. office, is now district manager of the new I-T-E office at 4216 Ponce de Leon Blvd., Coral Gables, Florida.

John W. Harrawood, formerly of the Company's St. Louis office, is now district manager at 709 Security Federal Bldg., Columbia, S. C. This office will cover sales of switches and protective devices for outdoor electric transmission and distribution systems. Other I-T-E products are handled by the E. H. Gilliam Company of Charlotte.

The Columbia office replaces the Summerville, S. C. office, which was closed recently after the death of the late John P. Voight.

NSPE Award To Dougherty

Nathan W. Dougherty, dean emeritus, University of Tennessee, has received the 1958 NSPE Award of the **National Society of Professional Engineers.**

Presented at the recent annual meeting of the National Society in St. Louis, the Award was made to Dean Dougherty "in recognition of his outstanding leadership in his profession as evidenced by his devotion to the advancement of engineering education, his sympathetic encouragement of students of engineering, his zealous promotion of the ideals and principles of his profession, and his humanitarian interest in his fellowmen."

Dean Dougherty was a member of the University of Tennessee faculty for forty years, the last sixteen as Dean of Engineering.

Square D — S. C.

Square D Company, electrical equipment manufacturers, has appointed **H. L. Prescott** manager of the **Greenville, S. C.** branch.

Mr. Prescott has been serving at the Charlotte, N. C. office since 1956 as a field engineer.

Parker Hydraulics Has Charlotte Distrib. Mgr.

H. J. "Jack" McBride has joined **Parker-Hannifin Corp.**, Cleveland, Ohio, to become district manager of distributor sales for products of Parker Fittings & Hose Division and the accumulators and check valves made by Parker Hydraulics Division. He is covering the territory of **Maryland, Virginia**, Eastern **Tennessee** and the **Carolinas** from his new headquarters in Charlotte. He will be working closely with Parker distributors, including Louis H. Hein Co., 703 Light St., Baltimore; Whitehead Metal Products Co., 4300 E. Monument St., Baltimore; Industrial Piping Supply, 1501 Dowd Rd., Charlotte; and Leinart Engineering Co., 412 East 5th Ave., Knoxville.

McBride was formerly in sales work with Neff-Perkins Co., Cleveland.

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Bailey Meter — Dallas

R. T. Cathey of **Bailey Meter Company**, Cleveland, Ohio, has been appointed district manager of the company's Dallas district. He succeeds F. D. Krusemark who has resigned.

A graduate of Clemson College, Cathey holds a bachelor of science degree in mechanical engineering. He joined Bailey Meter as a cadet engineer in 1947, and was assigned to the Charlotte, North Carolina district in 1948. In 1955 he was named an application engineer in the company's Pulp & Paper Division.

R. T. Keller has been appointed a Resident Engineer in **Jacksonville, Florida**, a subdivision of the company's Atlanta district. Keller's headquarters are at 1422 Dancy Street, Jacksonville, Fla.

The Jacksonville territory includes all of **Florida** and the southern tip of **Georgia.**

N.E.M.A. President

J. L. Singleton, Vice President, Industries Group, Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has been elected president of the **National Electrical Manufacturers Association** to fill the unexpired term of the late W. V. O'Brien.

Mr. Singleton has been a member of the NEMA Board since 1952, and served as an Association vice president since 1955. The Association will elect its 1959 officers at the annual convention next November at Atlantic City, New Jersey.

Cochrane — El Paso

G. M. Wallace and Company of Denver, Colorado, representing **Cochrane Corporation** for water treating and steam specialty equipment, has announced the opening of a branch office at Suite 512, Electric Building, El Paso, Tex., under the direction of **B. M. Huffman.**

W-K-M — Southeast

The appointment of **Walton L. McKinley** as a Direct Company Sales Representative for the ACF Lubricated Plug Valve has been announced by B. J. Gross, Vice President Marketing for **W-K-M**, division of ACF Industries, Incorporated.

He will report to William Gormley, Sales Manager of that department. Mr. McKinley will be located in Jacksonville, Florida and will cover the territories of **Florida, Tennessee, Alabama, Georgia** and **North** and **South Carolina.**

W-K-M is a leading manufacturer of valves and fittings for the oil producing, pipeline, refinery, gas and general industries.

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Joseph Ranna & G. Michael Baccich, Jr.

A. M. Lockett — N. O.

Joseph J. Ranna has been promoted to manager of the New Orleans district sales office of **A. M. Lockett & Company, Ltd.**, sales subsidiary of The Babcock & Wilcox Company. Mr. Ranna succeeds **George R. Hammett**, who will devote his entire time to his vice presidential duties.

G. Michael Baccich, Jr., resident sales engineer in Baton Rouge, La., replaces Mr. Ranna as assistant manager of the New Orleans district office.

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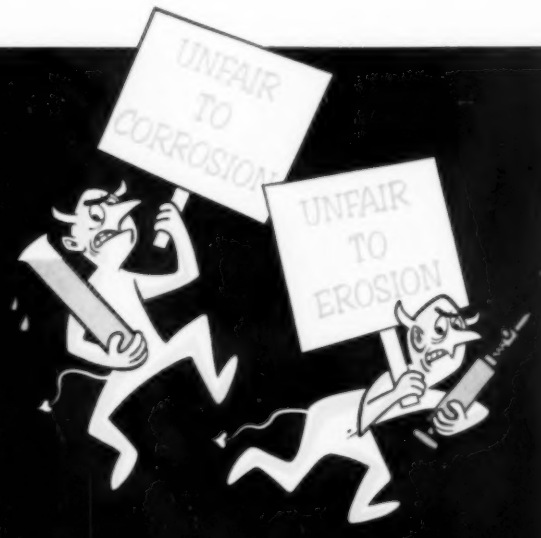


JENKINS NI-RESIST

GATE VALVES

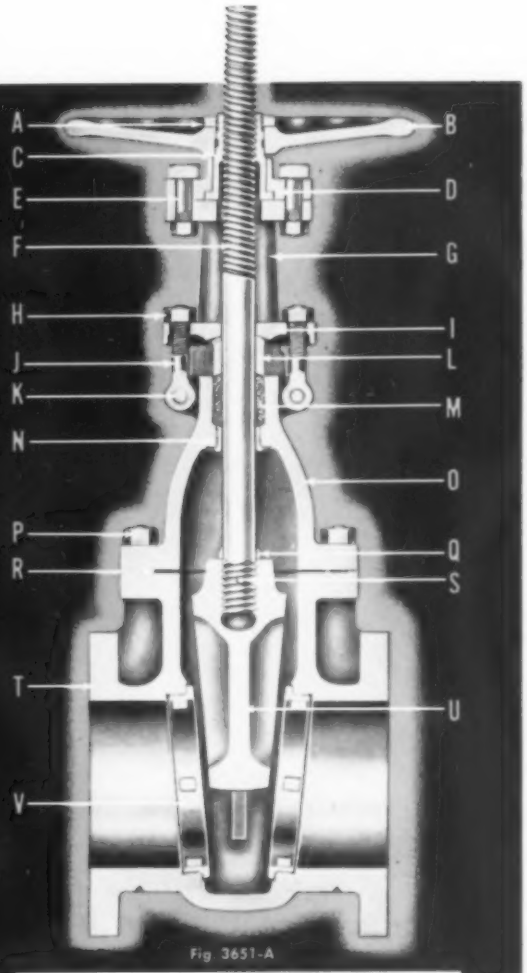


Fig. 3651-A

A Bronze yoke bushing nut
B Handy grip iron wheel
C Bronze yoke bushing
D Iron yoke cap with zerk fitting for lubricating bushing
E Steel yoke cap bolts and nuts
F TYPE 316 STAINLESS STEEL spindle
G NI-RESIST CAST IRON, TYPE 2, yoke
H Bronze eye bolt nuts
I Malleable iron gland flange
J Steel gland eye bolts
K Steel gland lug bolts and nuts
L TYPE 316 STAINLESS STEEL gland
M Teflon impregnated asbestos packing
N TYPE 316 STAINLESS STEEL bonnet bushing
O NI-RESIST CAST IRON, TYPE 2, bonnet
P Steel bonnet bolts and nuts
Q TYPE 316 STAINLESS STEEL spindle ring
R Asbestos gasket
S TYPE 316 STAINLESS STEEL wedge pin
T NI-RESIST CAST IRON, TYPE 2, through-port body
U TYPE 316 STAINLESS STEEL solid I-beam wedge
V TYPE 316 STAINLESS STEEL seat rings

Wherever valves are attacked by acids, salt and alkaline solutions, sea water, brine or other corrosive fluids, vapors or gases, "Jenkins Ni-Resist Gate Valves" are *fighting* words.

In a wide range of corrosive and erosive services common to the chemical, food, plastics, marine, petroleum, and pulp and paper industries, these valves have shown a remarkable ability to withstand corrosion and cut valve costs.

The secret of their long, trouble-free service is the combination of Ni-Resist type 2 cast iron and type 316 stainless steel trim, plus Jenkins *extra value* construction throughout. No other gate valves offer this combination for fighting corrosion.

When choosing Ni-Resist valves, let the famous Jenkins Diamond be your guide. Specify "JENKINS NI-RESIST" — for longer valve life. Write us, or ask your Jenkins Distributor for information folder No. 205. Jenkins Bros., 100 Park Avenue, New York 17.

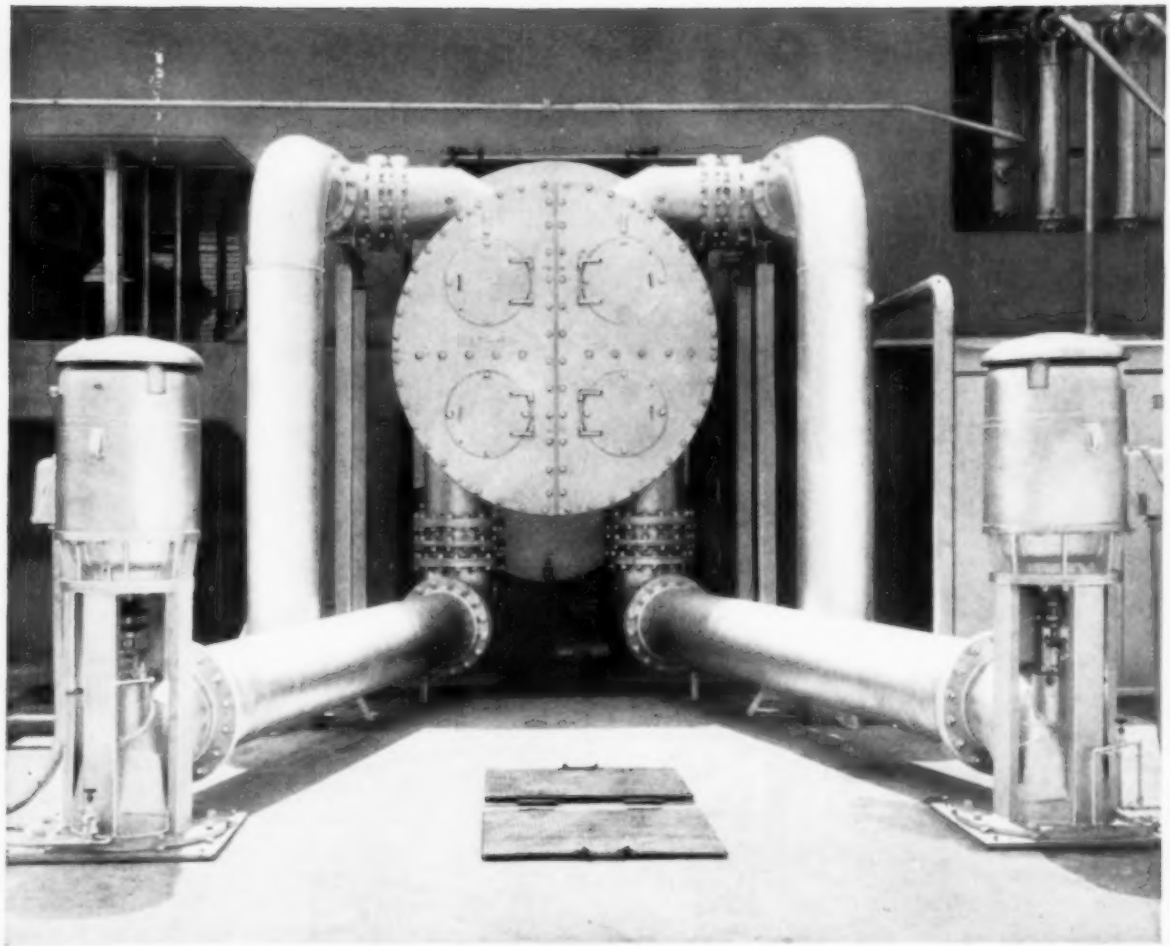
JENKINS VALVES

LOOK FOR THE JENKINS DIAMOND

JENKINS SINCE 1864

Jenkins Bros.

Sold Through Leading Distributors Everywhere



This power plant was designed and built by the Crisp County Power Commission, Cordele, Georgia.

First planned gas-steam turbine station depends on C. H. Wheeler equipment!

The first power plant in the United States designed from the beginning as a combined gas turbine-steam turbine station, is now in operation!

This combined-cycle, 15,000 kw plant at Warwick, Ga., satisfies the daily peak-load condition as well as base-load requirements. The system is unusually flexible; it can operate with the steam turbine only, or in combination with the gas turbine.

C. H. Wheeler equipment now in service at this history-making station includes a 10,000 sq. ft. Dual Bank, Two-Pass Condenser and two 12" x 16" Vertical Mixed Flow Pumps shown above (which supply 10,300 gpm of cooling water) . . . two Horizontally Split Case Condensate Pumps, a Tubejet® Steam Jet Vacuum Pump and a Hogging Ejector.

This equipment symbolizes the contribution C. H. Wheeler makes to the efficient, economical operation of steam generating plants everywhere.

Depend on C. H. Wheeler Condensers for:

- ***Pure condensate***
- ***Lower absolute pressure, higher vacuum***
- ***"Zero" condensate temperature depression***
- ***Deaeration to 0.03 cc. per liter with special designs providing deaeration to 0.01 cc. per liter***
- ***Patented Reverse Flow for faster, easier cleaning of tubes and tube sheets***

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Whenever you see the name C. H. Wheeler on a product, you know it's a quality product